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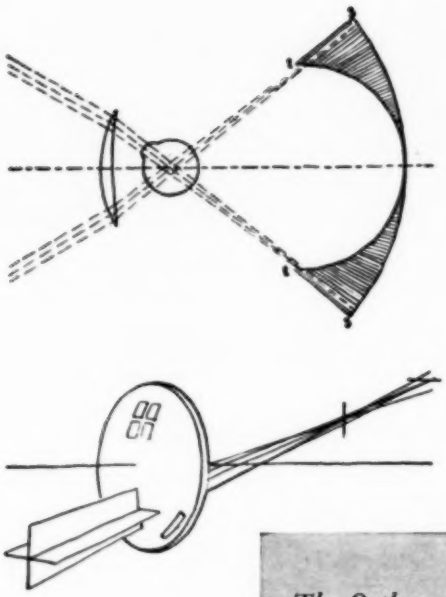
CHROMATIC ABERRATION • SPHERICAL ABERRATION • COMA



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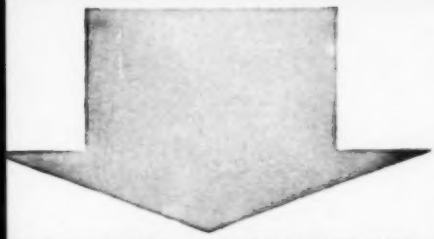

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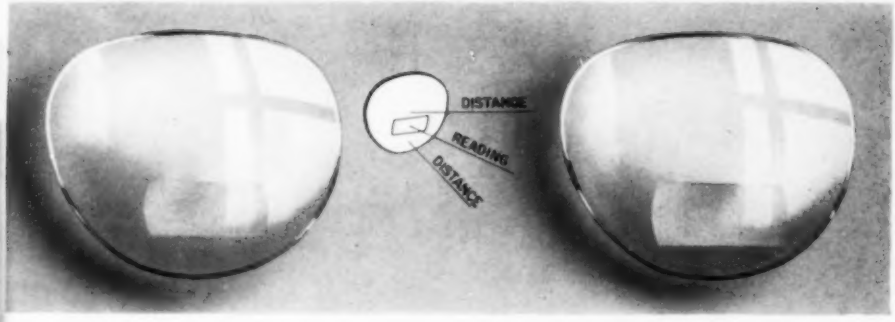

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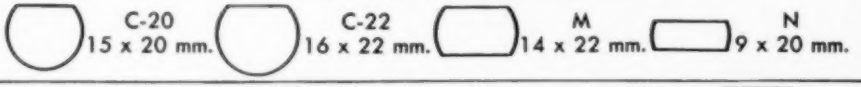

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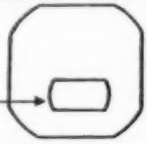

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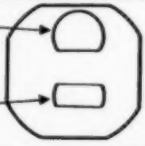

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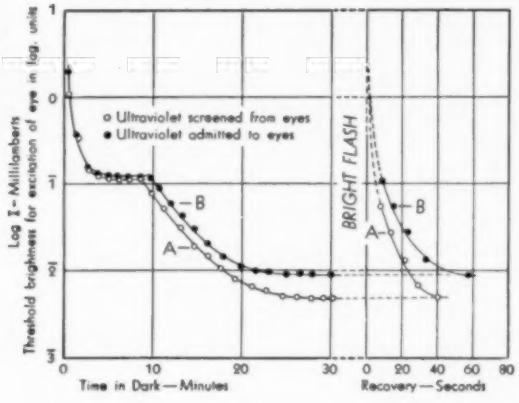

On the chart, right, open circles (A) show the course of dark adaptation after exposure to a light source from which ultraviolet has been filtered out. Black dots (B) show the course of delayed dark adaptation when ultraviolet radiation has been admitted to the eyes.

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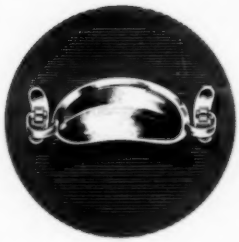

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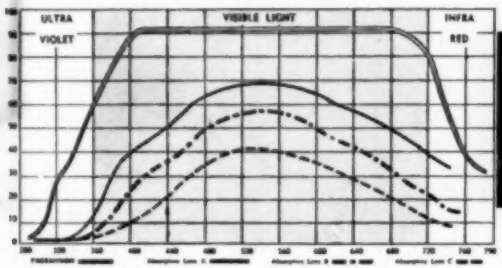

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1952

AMERICAN ACADEMY OF OPTOMETRY

ELECTED TO HONORARY FELLOWSHIP

William L. Benedict

AMERICAN JOURNAL OF OPTOMETRY
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Vol. 29 January, 1952 No. 1

COMMENTS ON LUNEBURG'S ANALYSIS OF BINOCULAR VISION*

Glenn A. Fry†
School of Optometry, The Ohio State University
Columbus, Ohio

INTRODUCTION

The writer has recently presented an analysis of binocular vision[1] which is similar in so many respects to the analysis presented by Luneburg[2] that it may prove helpful to point out the actual differences between the two.

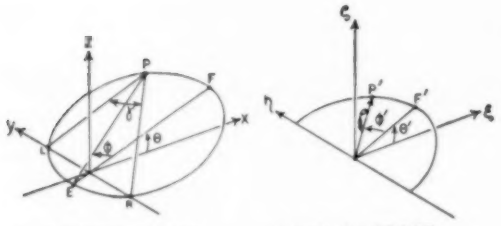
LUNEBURG'S ANALYSIS

Luneburg's analysis of binocular vision may be summarized briefly as follows. The position of a point in physical space can be specified in terms of a rectangular x, y, z coordinate system in which the axes are fixed with respect to the head. The y axis passes through the centers of rotation of the two eyes and the x axis is a perpendicular bisector of the base line connecting the centers of rotation (R and L) of the two eyes and the z axis is normal to the x, y plane through the origin (see Figure 1). The plane through R, L and the point P is the plane of regard for the point P. A circle in this plane through P, L and R is the Vieth-Müller circle for the point P. The line EF is the line of intersection of the x,z plane and the plane of regard. The line EP bisects the angle γ. The angle γ is the parallax angle of the point P and ϕ is the azimuth angle, γ and ϕ are known as bipolar coordinates and R and L are the two poles. θ is the angle of elevation of the plane of regard.

The relationship between visual and physical space is not affected by changing convergence from one point to another.

Visual space can also be represented by a system of rectangular

*Submitted on April 14, 1951, for publication in the January, 1952, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.
†Optometrist. Ph.D. Director, School of Optometry. Fellow, American Academy of Optometry.



A. PHYSICAL SPACE B. VISUAL SPACE

Fig. 1. Luneburg's coordinates of physical and visual space.

coordinates, ξ, η and ζ, as shown in Figure 1. The ξ, η and ζ axes of this system correspond to the x, y and z axes of physical space. Planes of regard in physical space are represented in visual space by planes containing the η axis. The position of the point P' corresponding to P in physical space can more conveniently be specified in terms of its angle of elevation θ', its angle of azimuth ϕ' and its distance ρ' from the origin. The transformation equations by which one can locate a point in visual space corresponding to a given point in physical space are as follows:

$$\theta' = \theta \tag{1}$$

$$\phi' = \phi \tag{2}$$

$$\rho = e^{-\sigma(\gamma+\mu)} \tag{3}$$

where σ and μ are constants.

The metric of visual space is as follows:

$$ds^2 = \frac{4K_2^2}{(1+K_1\rho^2)^2}\ (d\xi^2 + d\eta^2 + d\zeta^2) \tag{4}$$

where K_1 and K_2 are constants and where ds is the distance between any pair of neighboring points in visual space. Except when K_1 is equal to zero, visual space is non-Euclidian. K_2 is a constant which for a given observer during a given period and set of conditions of observation permits perceived distance to be expressed in centimeters.

Luneburg also defined his metric as follows:

$$ds^2 = \frac{4K_2^2}{(1+K_1\rho^2)^2}(\sigma^2\ d\gamma^2 + d\phi^2 + \cos^2\phi\ d\theta^2), \tag{5}$$

but this expression is not correct if ϕ' and θ' are to be defined as angles of azimuth and elevation as described above. Equation (5) can be derived from Equation (4) only if ϕ' is defined as the angle of longitude and ρ as the radial vector of the projection of the point P' in the ξ, η plane and θ' as the angle of elevation.

However, since Luneburg has not paid nearly so much attention to points above and below the x, y plane, as to points in the x and y plane,

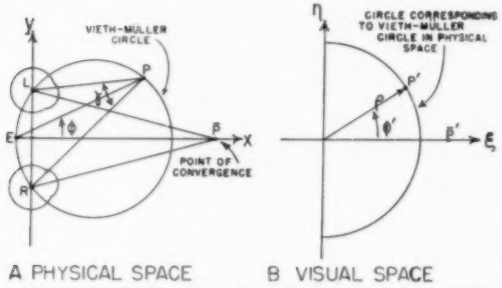


Fig. 2. Luneburg's coordinates of physical and visual space in the horizontal plane containing the centers of rotation.

it is probably just as well to confine attention to the x,y and ξ,η planes.

The relationship between the x,y and the ξ,η planes is illustrated in Figure 2. The equation for the Vieth-Müller circle through P, R and L is defined as follows:

$$\tan \gamma = \frac{2x}{x^2+y^2-1} . \qquad (6)$$

It represents the locus of points of constant γ. The locus of the points of constant ϕ is known as an hyperbola of Hillebrand and is defined by the following equation:

$$\tan 2\phi = \frac{2xy}{x^2-y^2+1} . \qquad (7)$$

Equations (6) and (7) are also transformation equations for converting from terms of x and y to terms of γ and ϕ and vice versa.

Hyperbolae of Hillebrand and Vieth-Müller circles for various values of ϕ and γ are shown in Figure 3, where the distance between L and R is 60 mm.

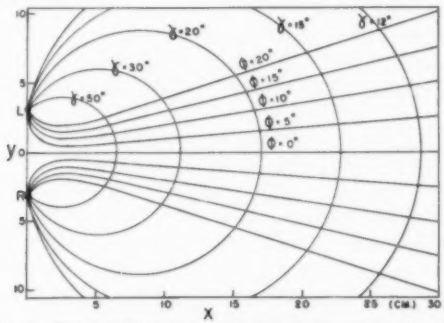


Fig. 3. Vieth-Müller circles and hyperbolae of Hillebrand.

The hyperbolae of Hillebrand are represented in the ζ, η plane by the straight lines (radial vectors) through the origin. These lines are the loci of points of constant ϕ'. The Vieth-Müller circles are represented by circles centered at the origin and represent the loci of points of constant ρ.

For the x,y and for the ξ,η plane Luneburg's metric may be defined as follows:

$$ds^2 = \frac{4K_2^2}{(1+K_1\rho^2)^2}\,(d\xi^2 + d\eta^2) = \frac{4\rho^2K_2^2}{(1+K_1\rho^2)^2}\,(\sigma^2\,d\gamma^2 + d\phi'^2). \tag{8}$$

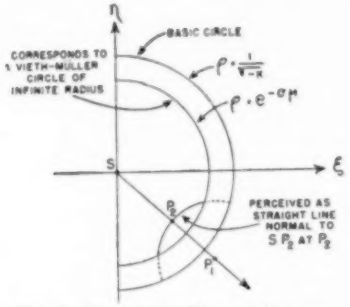


Fig. 4. Geodesics in the η, ξ diagram.

In the ξ,η diagram (Figure 4) circles which cross the basic circle ($\rho = \frac{1}{\sqrt{-K_1}}$) at right angles, are perceived as straight lines and constitute the geodesics of ξ,η space. The radial vectors passing through the origin are circles of infinite radius which cross the basic circle at right angles and therefore constitute a set of geodesics. They are the only straight lines in the ξ,η plane which are perceived as straight. A circle of finite radius which crosses the basic circle at right angles is perceived as a straight line normal to the radial vector on which it is centered.

Perceived distance (ρ'') measured from the origin along any given radial vector is given by the following equation:

$$\rho'' = \frac{K_2}{\sqrt{-K_1}} \log \frac{1+\rho\sqrt{-K_1}}{1-\rho\sqrt{-K_1}}. \tag{9}$$

The ξ'', η'' diagram in Figure 5 provides a more realistic representation than the ξ,η diagram of Luneburg's concept of the relation of physical space to perceived space. In the ξ'', η'' diagram

$$\phi'' = \phi' = \phi \tag{10}$$

and

$$\rho'' = \frac{K_2}{\sqrt{-K_1}} \log \frac{1+\rho\sqrt{-K_1}}{1-\rho\sqrt{-K_1}} . \tag{11}$$

Luneburg's metric defined in terms of ϕ'' and ρ'' is as follows:

$$ds''^2 = d\rho''^2 - \frac{K_2^2}{K_1} \sinh^2 \rho'' \frac{\sqrt{-K_1}}{K_2} d\phi^2 \tag{12}$$

In the case of distance along a radial vector, where $d\phi'' = 0$,

$$ds'' = d\rho'' . \tag{13}$$

This means that perceived distance from the origin is actually proportional to ρ''.

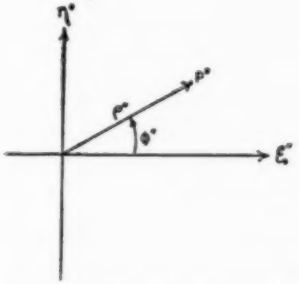


Fig. 5. The coordinates ϕ'' and ρ'' of a point P'' in the η'', ξ'' diagram.

It should also be noted that the perceived direction of a point is realistically represented in both the ξ,η and the ξ'', η'' diagrams; i.e., the points which appear to lie in the same direction from the origin are represented as lying on straight lines passing through the origin, and

$$\phi = \phi' = \phi'' . \tag{14}$$

The only thing about the ξ'', η'' space which makes it non-Euclidian is that perceived distances between pairs of points are not proportional to the represented distances except in the case of a pair of points on the same radial vector.

COMPARISON OF THE WRITER'S ANALYSIS WITH THAT OF LUNEBURG

(a) Dependence on the Point of Convergence

In the writer's analysis the relationship between physical space and perceived space changes with each new point of convergence because a change in convergence affects the relationship between the centers of the entrance pupil and the center of projection, and therefore the analysis must apply to some specific point of convergence. This does not mean

that the perceived location of an object must be affected when the eyes move from one point to another. Such a change in the perceived distance might occur, but in terms of Equation 16 this would depend upon a change in the constant k and not upon the change in position of the entrance pupils.

In Luneburg's analysis the centers of rotation are used as reference points in defining ϕ and γ, and since the centers of rotation are not affected by a change in convergence, the relationship between perceived and physical space is not affected by switching convergence from one point to another; i.e., so long as the constants K_1, μ and σ remain unchanged.

The two analyses are similar in that the correlation of impressions gleaned while moving the eyes from one point of convergence to another helps to stabilize the value of k in the writer's analysis and the values of K_1, σ and μ in Luneburg's analysis.

In the writer's analysis only points of convergence lying on the x axis have been considered, but in Luneburg's analysis the eyes may converge on points either on or off the x axis.

(b) The Position of the x,y Plane in Relation to the Head

Whereas Luneburg defines the x,y plane of physical space as fixed with respect to the head and containing the centers of rotation of the two eyes, the writer defines the x,y plane as the plane of regard which contains the centers of rotation and the point of convergence and which may be at any angle of elevation.

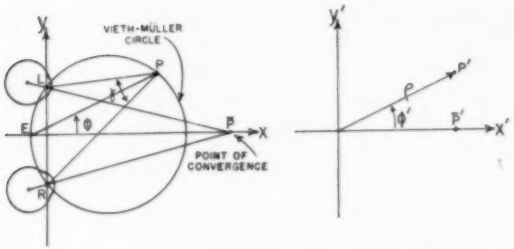
This means that the x,y plane is not fixed with respect to the head and can rotate around the base line connecting the centers of rotation of the two eyes.

(c) Definitions of the x and y Axes

Both Luneburg and the writer define the x axis of the x,y plane as being the perpendicular bisector of the line connecting centers of rotation of the two eyes. The writer, however, defines the y axis as the line through the centers of the two entrance pupils whereas Luneburg defines it as the line through the centers of rotation of the two eyes (see Figures 2 and 6).

(d) Definitions of γ and ϕ

In order to relate physical space to visual space, both Luneburg and the writer make use of the pair of bipolar coordinates, ϕ and γ which are illustrated in Figures 2 and 6. R and L are the two poles of the bipolar coordinate system. In the case of the writer these two points represent the centers of the entrance pupils, and in the case of Luneburg the centers of rotation. The point P is any point in the



A PHYSICAL SPACE B. VISUAL SPACE

Fig. 6. Fry's analysis of the relation between physical and visual space in a plane corresponding to a plane of regard.

x,y plane. The angle γ subtended by the two poles at this point may be called a parallax angle. The circle through the point P and the two poles, R and L, is called a Vieth-Müller circle and is defined by Equation (6). This circle intersects the x axis at the point E. The line connecting P and E is the bisector of the angle γ, and the angle ϕ that this line makes with the x axis is the azimuth angle of the point P.

In both analyses, hyperbolae defined by Equation (7) are known as the Hyperbolae Hillebrand and represent the loci of points which have the same ϕ value. Vieth-Müller circles are of the loci of points which have the same γ value.

In Figure 3 are shown Vieth-Müller circles and hyperbolae of Hillebrand which have various γ and ϕ values. In the writer's analysis, R and L represent the centers of the entrance pupils whereas in Luneburg's analysis they represent the centers of rotation as described above.

(e) Perceived Direction

In the writer's analysis the x,y plane of physical space is represented in visual space by the x', y' plane in which the x' and y' axes coincide with the x and y axes of the x,y plane in physical space (see Figure 6). A point in the x', y' plane can also be specified in terms of the polar coordinates, ϕ' and ρ:ϕ' represents angular displacement from the x' axis and ρ represents distance from the origin.

The transformation equations by which a point in physical space can be located in visual space and vice versa are as follows:

$$\phi = \phi' \tag{15}$$

$$\frac{1}{\rho} = k + \frac{H_1 \tan^2\phi}{2} + \frac{\gamma}{a}, \tag{16}$$

where k, H_1, and a are constants.

The perceived direction ϕ' of a point P in the writer's analysis is essentially the same as the perceived direction ϕ'' in Luneburg's analysis.

(f) Perceived Distance

The perceived distance (ρ) from the origin in the writer's analysis is given by Equation (16) and perceived distance (ρ'') from the origin in Luneburg's analysis is given by Equation (9). In the case of perceived distance measured along the x'' axis where $\phi = 0$, Equation (16) reduces to

$$\frac{1}{\rho} = k + \frac{1}{x} \tag{17}$$

where k is a constant. Figure 7 shows a comparison of the writer's

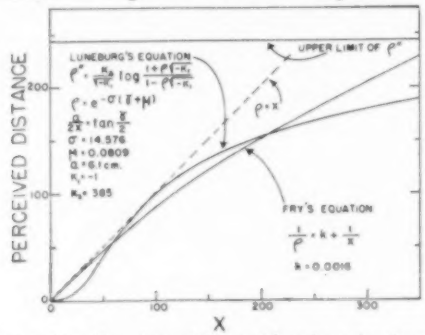


Fig. 7. Comparison of the Equations of Fry and Luneburg for the perceived distance of objects on the x axis.

curve relating perceived distance (ρ) along the x' axis to physical distance (x) and the type of curve Luneburg would use in relating perceived distance (ρ'') along the ξ'' axis to physical distance x. The values used for σ and μ are those which Luneburg has derived from actual data for one of Blumenfeld's subject having an interpupillary distance of 61 mm. A value of —1 has been arbitrarily selected for K_1. Values for the constants, K_2 in Equation (9) and k in Equation (17), have been selected which yield grossly comparable curves within the range from 0 to 300 cm.

(g) The Frontal Plane

Both analyses provide a reasonably adequate explanation of the variation in the curvature of the apparent frontal plane with fixation distance.

(h) The Euclidian Vs. Non-Euclidian Character of Visual Space

In the writer's analysis visual space is strictly Euclidian, and in

Luneburg's analysis it is more generally defined as a space of constant curvature. Depending upon the value of K_1 which has to be determined by experiment it may be either Euclidian or non-Euclidian. From the observation that "parallel" alleys are not identical with "distance" alleys Luneburg deduced that visual space can be conceived to be non-Euclidian. At least by making this assumption one can derive equations which represent reasonably well the data for "parallel" and "distance" alleys, and which show the discrepancy between the two. In the writer's analysis, the two sets of alleys should agree and the discrepancy has to be accounted for in terms of the difference in eye movement patterns or changes in the constant k during the experimental determination of the two types of alleys.

(i) Perceived Linear Size of Objects on the x Axis

In the writer's analysis the ratio of perceived linear size of an object on the x axis to its perceived distance is equal to its physical angular size in radians, but in Luneburg's analysis perceived linear size (ds) and perceived distance (ρ'') are related to physical angular size ($d\phi$) by the following equation:

$$\frac{ds}{\rho''} = \frac{K_2}{-K_1} \frac{\sinh \rho'' \frac{-K_1}{K_2} d\phi}{\rho''} \qquad (18)$$

where ds is the perceived linear distance between two points which lie close to the x axis in a frontal plane, and $d\phi''$ is the apparent angular separation.

REFERENCES

[1]G. A. Fry. Visual Perception of Space. Am. J. of Optom., 27:11:531, Nov., 1950.
[2]R. K. Luneburg. Mathematical Analysis of Binocular Vision. Princeton, 1947.

ABSTRACTS

THE OCULAR SYMPTOMS OF MIGRAINE. F. B. Walsh. North Carolina Medical Journal. 12.7 271-273. 1951.

Eyestrain is a frequent cause of headache. The mechanism which underlies headaches due to this cause is more difficult to visualize than the pain resulting from changes in size of the cranial vessels. Some have criticized the term "eyestrain," but actually the term has much to commend it. It is vague enough to cover much of our lack of knowledge concerning the condition.

Headaches which originate in eyestrain and are associated with errors of refraction or muscle imbalance, follow a pattern. Although the relationship between the use of the eyes and the development of such headaches may not be obvious, skilled questioning will usually reveal that such a relationship exists. The author states that it has always been difficult for him to believe that an individual who retires at night feeling fit should awaken with a headache due to eyestrain.

ROBERT E. BANNON.

THE EFFECT OF ORTHOPTICS ON THE ZONE OF BINOCULAR VISION IN INTERMITTENT EXOTROPIA—A CASE REPORT*

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INTRODUCTION

The course and extent of the possible modifications of the zone of clear single binocular vision due to the effects of visual training have not been clearly established. The fundamental variables of the zone were discussed by Fry,[1] and certain conclusions have been drawn from the analysis of the zone by Hofstetter.[2] These may be re-stated and amplified as follows:

Width

(1) The width of the zone represents the range of relative convergence and is approximately constant at all levels of accommodation when allowance is made for depth of focus, hence the sides of the zone are approximately parallel in a graphical representation of the zone. The width may be varied by training, particularly on the positive end (base-out).

(2) Where a change in the width is brought about at one level of accommodation, it is equaled at all other levels of accommodation.

(3) Variations in the width of the zone are not followed by variations in position of the phorias. The phoria line remains stationary and parallel to the sides of the zone.

Slope

(1) The slope indicates the accommodative-convergence relationship for the individual; it is the graphical representation of the gradient, or the determination of the ACA ratio by use of phorias at different levels of accommodation.

(2) The slope does not vary with training.

Position

(1) In some instances the entire zone appears to change position if tested on different days. Such changes appear to be associated with intermittent strabismus, often when the subject is not aware of the con-

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dition and exhibits no other symptoms of it. The change in position may be accompanied by a change in width of the zone.

Reliability and Validity

(1) Good conformity to the parallelogram characteristics of the zone usually indicates both high validity and reliability of the data. Lack of conformity may indicate lack of either or both validity and reliability. Insofar as reliability is synonymous with repeatability of findings, while validity describes the extent to which the function measured is in fact the function which the test is proposed to measure, observation of a single set of data or a single plotting of the graphical zone will ordinarily not reveal whether it is lack of reliability or lack of validity which is responsible for a faulty finding or a combination of faulty findings. In other words, lack of conformity of a series of phoria findings to a straight line, or lack of conformity of the other pertinent findings to the parallelogram characteristics of the zone, may be due either to a fundamentally incorrect or vicarious instruction, response, or criterion, whence validity is involved, or to a normally variable or inaccurately measured response, whence reliability is involved.

(2) Reliability and validity of the findings increase with training.

With the above conclusions in mind, it was felt by the authors that the case herein presented would be of interest since changes observed in several separate examinations during the lengthy course of training appear to be at variance with some of the statements above.

CASE HISTORY AND PRELIMINARY EXAMINATION

March 23, 1949: The parents of Miss D. H., age 6, say that her right eye seems to turn out quite frequently, especially in bright light or when she is tired. The deviation was first noticed two or three years ago, but did not seem to coincide with any sickness or other etiological factor, and nothing was done about it at that time. Her vision seems to be good and she has never worn glasses, although all other members of the family do so. There is no family history of strabismus. Her health is excellent, but she develops styes rather frequently in either eye. On entering school, her teacher and the school nurse noticed the deviation and other signs of visual trouble, such as much eye-rubbing, squinting, and dislike of any work requiring close visual attention, so they suggested an eye examination. In September, 1948, she was taken to an optometrist and at his direction she wore a patch over her left eye continuously for two months. Following this, she wore the patch only after school and was given visual training at his office. In February, 1949, she was referred by her optometrist to the clinic at Los Angeles College of Optometry for further orthoptic training.

The lid margins show a slight blepharitis and general signs of irritation. No pathology is revealed, either externally or ophthalmoscopically. Versions, rotations, and motility are fair, but the cover test reveals an alternating exotropia at distance and a high exophoria or an exotropia at near. The exotropia is voluntarily overcome when the deviation is brought to the patient's attention although she says she does not experience diplopia when the eyes are in the squinting position. She converges to within 7 or 8 inches from the bridge of her nose where the right eye ceases fixation and turns out.

The case record does not at this point contain the results of further tests of the amount of the tropia, extent of suppression, type of correspondence, etc., presumably because of the unreliability of the patient's answers at this time as well as the difficulty of revealing the tropia for a sufficient time to permit measurements to be made. Although the parents report a frequently recurring and persistent deviation, such deviation occurred only briefly and unpredictably in the clinic and was quickly overcome when noticed by the patient or when the clinician attempted measurements of any kind. The patient would then exhibit apparently normal binocular vision and an exophoria of only about 10Δ. The squint could usually be briefly elicited with the cover test, the only objective evidence of its existence at this time.

The diagnosis given is that of intermittent exotropia of about 20Δ, alternating in type but with the right eye deviating more often than the left, possibly occurring for distance fixation only or more readily than for near fixation, and apparently subject to the volition of the patient. There is some evidence of suppression when the eyes are in the squinting position, and correspondence appears to be normal.

CLINIC PROCEDURES

Training

The early phases of training were specifically prescribed by the training clinic supervisor and carried out by variously scheduled students in the clinic. This training consisted of work in the basic skills starting with monocular rotations and fixations, followed by simultaneous perception and diplopia training, binocular rotations and fixations, fusion, stereopsis, and finally base-out and convergence work. In the later phases of this training the patient was assigned to a single senior student who determined the course and degree of the training and carried it out for a series of 12 to 18 training periods. In addition the later phases were augmented with home training consisting of push-up and convergence exercises, and a temporary training prescription of 4 prism diopters base-out was worn for short periods each day.

TABLE I

Clinic records of refraction performed during the course of visual training

Test	Exam. Date Examiner *Test Number*	A 3/23/49 C.W. (Student)	B 4/13/49 H.C. (Staff)	C 9/14/49 L. (Staff)
6 M. phoria (No Rx)	#3.	6 exo	6 exo	20 exo
40 Cm. phoria (No Rx)	#13A.	not reliable	unreliable	16 exo (variable)
Static Retinoscopy	#4. O.D.	plano +.25 x 180	+.50	+.25 +.25 x 180
	O.S.	+.25 +.50 x 180	+.25	+.25 +.25 x 180
40 Cm. dynamic retinoscopy	#5. O.D.	+1.25 add	+1.00 add	+1.00 add
	O.S.	+1.25 add	+1.00 add	+1.75 add
Subjective findings	#7. O.D.	+.25 +.50 x 180	+.25 +.25 x 180	+.25 +.50 x 180
	O.S.	+.25 +.50 x 180	+.25	+.25
6 M. phoria through #7	#8.	over 15 exo	14 exo	21 exo
6 M. base-out to blur through #7	#9.	X	X	X
6 M. base-out break and recovery through #7	#10.	12/—3	20/2	2/—8 then —6/—18
6 M. base-in break and recovery	#11.	24/10	28/8	28/22
40 Cm. phoria through #7, and gradient	#13B.		no response	
40 Cm. unfused crossed cylinder	#14A.	+1.00 add	+1.75 add	+1.50 add
40 Cm. phoria through #14 A	#15A.	over 15 exo	16 exo	
40 Cm. fused crossed cylinder	#14B.	+1.25 add (10 base-in to fuse)	+1.75 add	doubles
40 Cm. phoria through #14 B	#15B.		16 exo	
40 Cm. base-out blur, break, and recovery	#16.	Patient unable to sit still	12/2	Breaks as soon as rotary prism is thrown in
40 Cm. base-in blur, break, and recovery	#17.		12/—4	
33 Cm. binocular minus lens amplitude	#19A.	+7.75	over 8.00	Suppression in left eye
40 Cm. binocular minus lens to blur	#20.	—3.75 (doubtful)	—5.25 } through #14B	
40 Cm. binocular plus lens to blur	#21	+1.75	+2.25 }	

TABLE I (continued)

Test	Exam. Date Examiner *Test Number*	D 4/4/50 M.S. (Staff)	E 5/24/50 R.L. (Student)	F 6/7/50 H.C. (Staff)
6 M. phoria (No Rx)	#3.		18 exo	6 exo
40 Cm. phoria (No Rx)	#13A.		16 exo	8 exo
Static Retinoscopy	#4. O.D.	—.50 +1.00 x 180	+.75 +.50 x 75	+.50
	O.S.	+.75	+.50	plano
40 Cm. dynamic retinoscopy	#5. O.D.	+.75 add	+.25 add	+1.00 add
	O.S.	+.75 add	+.25 add	+1.00 add
Subjective findings	#7. O.D.	+.25 +.75 x 180	+.50 +.50 x 170	+.25 +.50 x 180
	O.S.	+.50	+.50 +.25 x 155	+.50
6 M. phoria through #7	#8.	19 exo	10 exo	6 exo
6 M. base-out to blur through #7	#9.	X	10/24	X
6 M. base-out break and recovery through #7	#10.	6/0	40/6	14/—4
6 M. base-in break and recovery	#11.	26/12	24/18	18/6
40 Cm. phoria through #7, and gradient	#13B.	14 exo	8 exo	8 exo
40 Cm. unfused crossed cylinder	#14A.	+1.25 add	+.50 add	
40 Cm. phoria through #14 A	#15A.	24 exo	12 exo	
40 Cm. fused crossed cylinder	#14B.		+.50 add	+1.00 add
40 Cm. phoria through #14 B	#15B.		12 exo	12 exo
40 Cm. base-out blur, break, and recovery	#16.	(#7) X/13/—4 (#14A) X/9/—14	24/27/16	X/14/—6
40 Cm. base-in blur, break, and recovery	#17.	(#7) X/34/22 (#14A) X/38/20	16/24/12	X/32/14
33 Cm. binocular minus lens amplitude	#19A.	+4.00	+7.00	over 5.00
40 Cm. binocular minus lens to blur	#20.	—1.50	—4.50	—4.50
40 Cm. binocular plus lens to blur	#21.	+3.00	+3.00	+2.50

TABLE I (continued)

Test	Exam. Date Examiner *Test Number*	G 10/27/50 J.N. (Student)	H 10/27/50 M.B. (Staff)	I 1/16/51 M.S. (Staff)
6 M. phoria (No Rx)	#3.	6 exo		
40 Cm. phoria (No Rx)	#13A.	10 exo		
Static Retinoscopy	#4. O.D.	—.25 +.75 x 10	—.25 +.75 x 180	plano +.50 x 180
	O.S.	+.25 +.25 x 180	+.25	+.50
40 Cm. dynamic retinoscopy	#5. O.D.	+2.50 +.50 x 10		+1.25 add
	O.S.	+3.00 +.25 x 180		+1.25 add
Subjective findings	#7. O.D.	plano +.50 x 175	—.25 +.75 x 180	+.50 +.25 x 180
	O.S.	+.25	+.25	+.25
6 M. phoria through #7	#8.	4 exo →13 exo	8 exo	9 exo
6 M. base-out to blur through #7	#9.	11	X	12
6 M. base-out break and recovery through #7	#10.	20/12	10/4	18/13
6 M. base-in break and recovery	#11.	32/20	24/20	22/18
40 Cm. phoria through #7, and gradient	#13B.	12→17 exo +1.00/0	12 exo +1.00/—4	9½ exo
40 Cm. unfused crossed cylinder	#14A.	+2.50 add	+2.00 add	+1.25 add
40 Cm. phoria through #14 A	#15A.	26 exo	20 exo	15 exo
40 Cm. fused crossed cylinder	#14B.	+2.50 add	+1.50 add	+1.00 add
40 Cm. phoria through #14 B	#15B.	30→18→12 exo	14 exo	13½ exo
40 Cm. base-out blur, break, and recovery	#16.	16/23/11	X/20/12	19/21/7
40 Cm. base-in blur, break, and recovery	#17.	22/28/24	X/16/8	X/26/11½
33 Cm. binocular minus lens amplitude	#19A.	+6.50	+6.50	+8.25
40 Cm. binocular minus lens to blur	#20.	—4.75	—4.00	—5.75
40 Cm. binocular plus lens to blur	#21.	+2.50	+2.00	+2.50

The total course of training consisted of 127 periods of one-half hour each, distributed over approximately 21 months. At the time of dismissal the symptoms of visual discomfort have disappeared, and her teacher and the school nurse report that no deviations have been observed

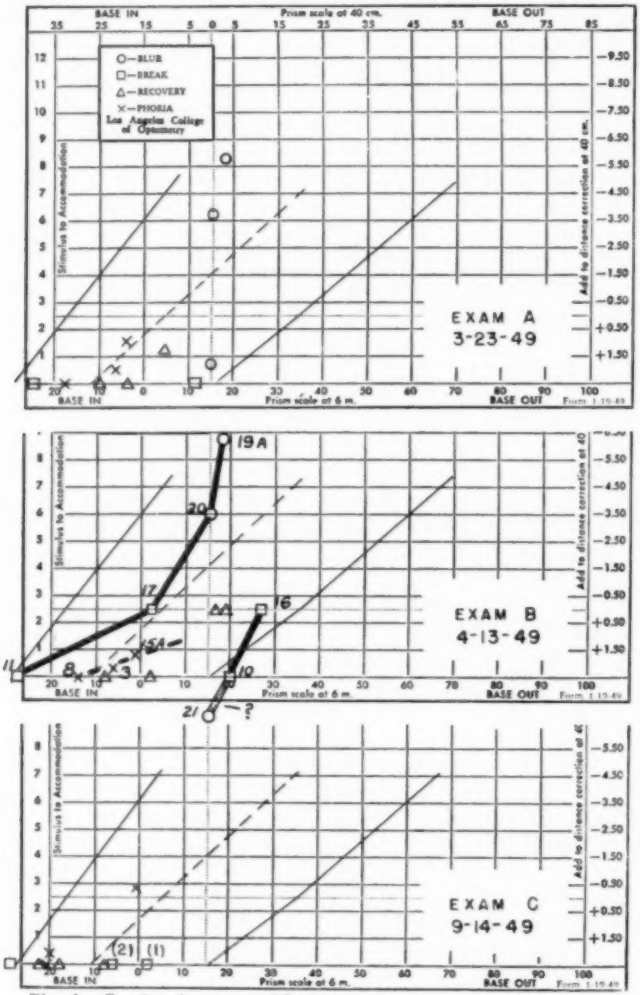

Fig. 1. Continued on page 19.

for some time. The cover test reveals an exophoria at all points which is quickly overcome and the patient is aware of momentary diplopia as

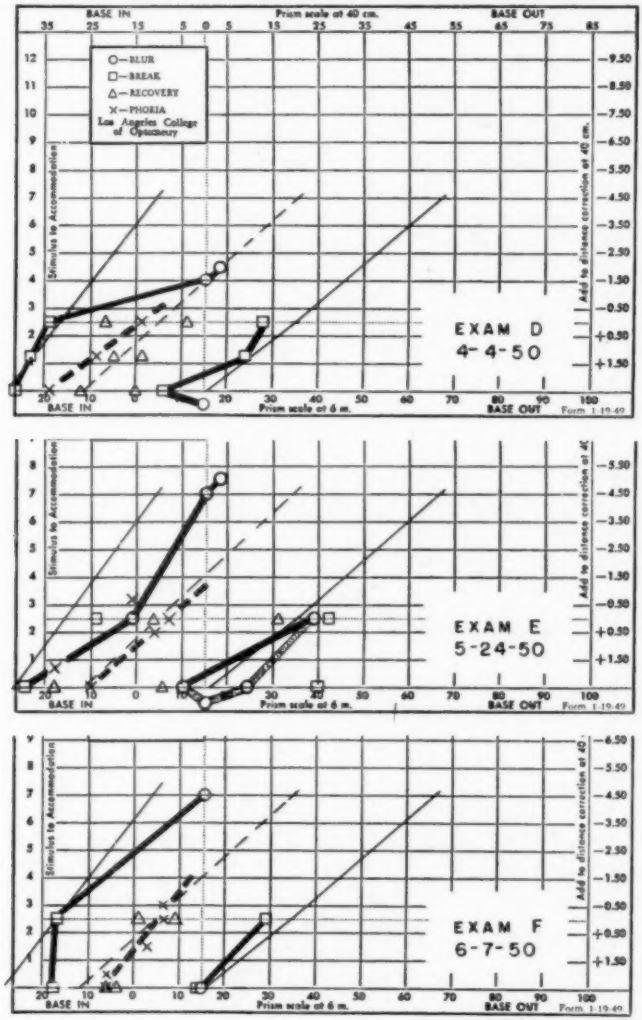

Fig. 1. Continued on page 20.

the cover is removed in this test. Her entire visual performance seems much improved in the opinion of her parents.

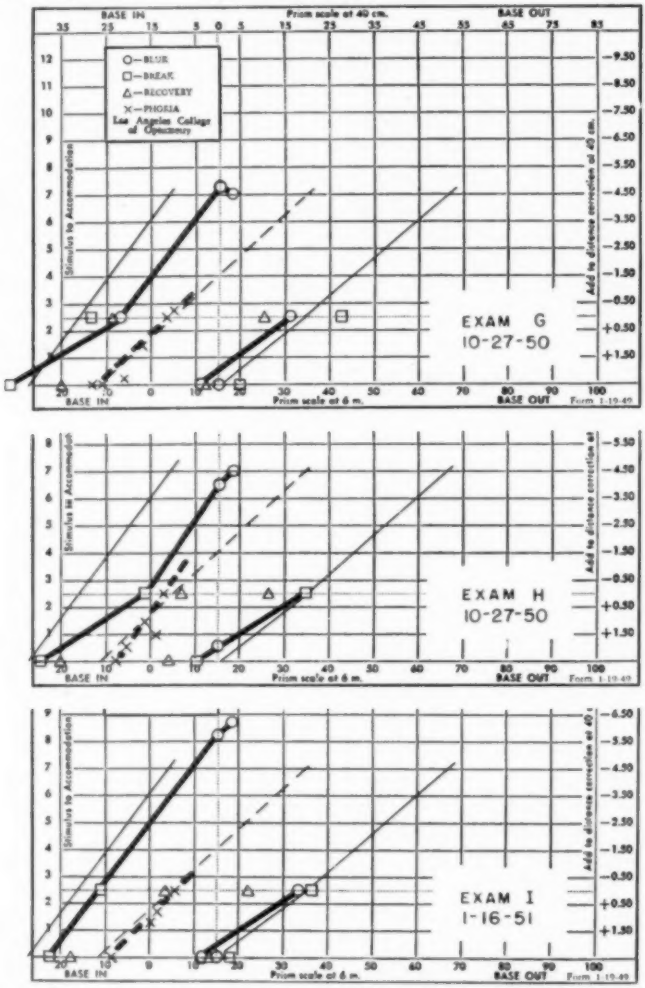

Fig. 1. Graphical presentation of the data on Table I. Findings representing the limits of the zone of clear single binocular vision are connected with a heavy solid line. Phorias are connected with a straight heavy dashed line. In light lines is shown the zone found in the final examination (see Fig. 2).

Examinations

Patients in the visual training clinic are regularly referred to the refracting clinic for complete reexamination and a progress report after each 12 to 18 training periods, or at the discretion of the student in charge of the training program for that patient. However, these examinations may at times be omitted until considerable improvement in performance is demonstrated in the training clinic.

The clinical refractions are performed by senior students and checked or re-performed by a staff doctor. No reference is made at this time to previous clinical records, the patient being examined as a new case to encourage independence and unbiased judgment of the findings. The examinations were limited in time to a maximum of 50 minutes in most cases. This included a complete case history which was taken each time, as well as the preliminary tests and the external and ophthalmoscopic examinations, and may account for the omission of certain findings when the patient's response was uncertain or difficult to obtain.

RESULTS

The clinical findings are shown in Table I as they were recorded on the clinic record cards, omitting the ophthalmometer readings and the vertical phorias and ductions which were essentially negative and therefore assumed to be unrelated to the primary problem in all examinations. Acuity measurements were approximately 20/20— uncorrected and 20/20+ with the subjective finding in place (O. U., O.D., and O.S.) in all examinations. The clinical procedures and the numbering system employed in all of the examinations were those described by Michaels[3] and correspond for the most part to the system employed by the Optometric Extension Program.

The same data are presented in graphical form in Figure 1 where the individual findings are recorded according to the table of symbols shown on the graphs. The test numbers of the findings are also shown on the second graph (Figure 1-B). No allowance was made in plotting the findings for the difference in the subjective finding through which the tests were made, since the equivalent spherical variation from the mean in all examinations was never in excess of + or — .25 D. (see Figure 3), which would affect the position of the zone only slightly. It will be noted that the binocular minus lens amplitude finding (test number 19A) is plotted .50 D. higher than the values shown in Table I. This is done because the test is performed at 13 inches (a stimulus to accommodation of 3.00 D.) but in recording the finding only 2.50 D. is conventionally added to the total minus lens finding for the initial accommodation actually in use.

Those findings which represent the limits of the zone of clear single binocular vision are connected with a heavy solid line. The phorias are connected with a heavy dashed line. Two examinations (A and C) did not have sufficient findings to indicate the probable boundaries of the zone.

TABLE II

Clinical data for the final determination of the patient's zone of clear single binocular vision.

Date: 1/18/51 Examiner: G.G.H.
Basic Rx: O.D. +.25 +.50 x 180
O.S. +.25

Test distance	6 m.	40 cm.	40 cm.	40 cm.
Lenses added to basic Rx	0	0	—1.00	—3.00
Stimulus to accommodation	0	2.50	3.50	5.50
Phoria	11 exo	10 exo	2 exo	10 eso
Base-out prism	16/20/18	X/20/17	X/27/22	X/42/33
Base-in prism	X/28/24	X/32/13	X/27/10	X/18/4

On each graph is also shown in light lines the outline of the zone and the phoria line as determined in a separate and more extensive examination on January 18, 1951, shortly before final dismissal of the patient. The findings for this examination are shown in Table II and Figure 2. The phorias and base-in and base-out findings were taken repeatedly at four levels of accommodative stimulus, 0, 2.50, 3.50, and 5.50 D, to determine the zone. All near point base-in and base-out

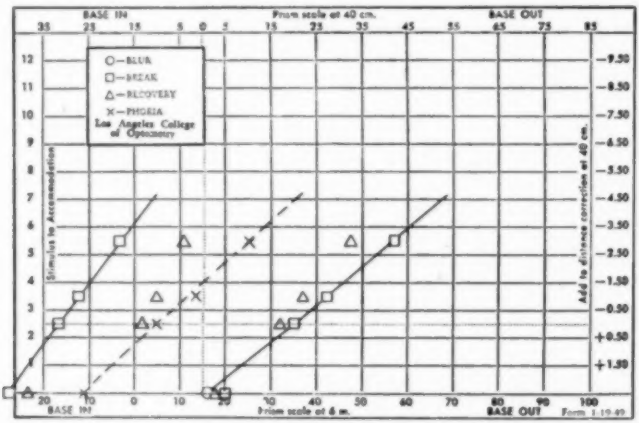

Fig. 2. Graphical presentation of the data of Table II, showing the limits of the zone of clear single binocular vision and the position of the phoria line at the conclusion of the course of training.

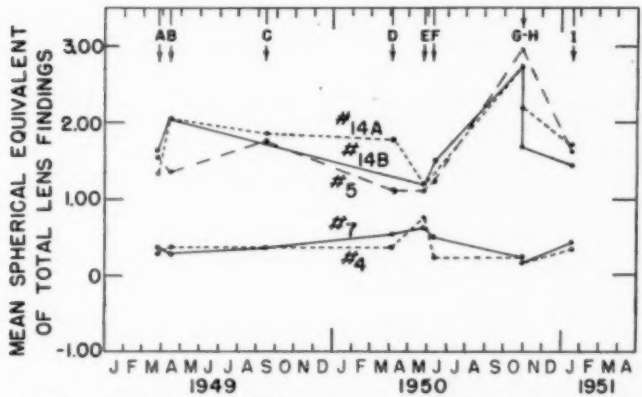

Fig. 3. The refractive findings, #4, #5, #7, #14A, and #14B, plotted in relation to examination date. The distance findings, #4 and #7, show no significant variation during the course of training. The near findings, #5, #14A, and #14B, show extreme variation but no significant overall change.

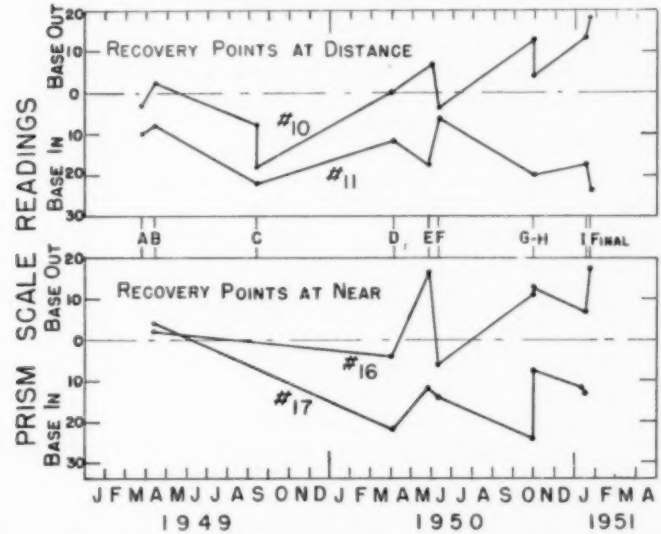

Fig. 4. The recovery points of #10, #11, #16, and #17 tests plotted in relation to examination date, showing a significant widening of the range between them, particularly on the base-out side.

blur points appeared to coincide with the breaks, the patient maintaining under careful questioning that the letters were sharp and clear up to the point of doubling but blurred slightly just before they broke. All findings were highly repeatable and the patient's responses good.

Five of the routine findings, static retinoscope, dynamic retinoscope with fixation at 40 cm., subjective findings, unfused cross-cylinder and fused crossed cylinder, are not conventionally represented on the accommodation-convergence graph. To show their trends and variations they are plotted separately in Figure 3.

The recovery points of the adduction, abduction and positive and negative relative convergence findings, although represented on each graph, do not lend themselves to easy interpretation in this form inasmuch as the significance of the recovery points in a consideration of the zone has not been established. To make evident their trends and variations they are plotted again, in chronological sequence, in Figure 4.

COMMENTS ON RESULTS

Inspection of the graphs of Figure 1 in sequence shows:

(1) An apparent change in slope during the course of the training, the phoria line swinging gradually counterclockwise, indicating a decrease in the ACA ratio.

(2) Apparent changes in the amount of exophoria at all distances, the distance phoria showing a pronounced decrease with the near exophoria showing only a slight decrease. Insofar as there is this apparent difference in shift at distance and near this observation duplicates (1). The basic point here, however, is that there were overall shifts with a resultant apparent change in position of the phoria line relative to the boundaries of the zone.

(3) Changes in the width of the zone which appear unequal, and even in opposite directions, at different levels of accommodative stimulus (e.g., an increase in width at the 2.50 D. level but a decrease at the zero level is shown in Figure 1-D).

(4) Less variation of the base-out limits than of the base-in side of the zone, with an apparent increase in negative relative convergence at near as the principal end result of the training.

(5) Little or no change in position of the entire zone in any of the examinations.

Before accepting these observations the findings for each examination should be reviewed for possible sources of error and other factors which would influence the results. This review is facilitated in particular by the more comprehensive subsequent examination represented in Figure 2.

Examination A

Although insufficient data were obtained to determine the zone boundaries it is evident that those findings shown conform generally to the final determination of the zone. The recording of two of the phorias as "over 15 exo" gives little indication of where the phoria line should actually be plotted but at least indicates a slope not greatly different than that of the final examination. The clinic record (see Table I) suggests that the patient was squinting during at least part of this examination.

Examination B

It will be seen that the distance findings in this examination coincide almost exactly with the distance findings of the final examination. From the known characteristics of the zone of clear single binocular vision we would expect to find a range of relative convergence (width of the zone) at least as great at near as at distance. Instead a decreased range is seen at the 2.50 D. level, the total width being only one-half that found at the zero level.

The slope of the phoria line indicates that the ACA ratio was between 10 and 16 at the time of this examination, as compared to the ratio of 6 prism diopters of convergence per diopter of accommodation which is demonstrated in the final tests. This excessive ratio seems to be substantiated by the slope of the base-in side of the zone from the zero to 2.50 D. levels.

However:

(1) No phorias were taken at the 2.50 D. level or higher because of the patient's lack of response, probably indicating an unstable and fluctuating phoria due to inadequate control of accommodation.

(2) Projection of the phoria line determined by two or three closely placed phorias can only magnify the variations in those phorias (e.g., a variation of 1 prism diopter in the distance phoria in this examination would show, when extrapolated to the 2.50 D. level, a variation in the predicted near phoria of more than 3 prism diopters in the opposite direction). Most significant in this case, the extrapolation of the phoria line indicates an esophoria at near which contradicts the evidence of the preliminary examination and the case history.

(3) It is doubtful that the accommodative stimulation and inhibition findings (#20 and 21) on the clinic record actually represent the total lens powers added to the fused crossed cylinder (#14B) add as is indicated, since the acceptance of a total of +4.00 D. over the subjective at 16 inches is to be regarded as extremely questionable. It is more probable that the tests were started with the fused crossed cylinder

finding in place but recorded as total lens power over the subjective.

If the accommodative stimulation and inhibition findings are plotted with this assumption, as though taken through the subjective finding, the graph (see Figure 5) assumes a considerably different ap-

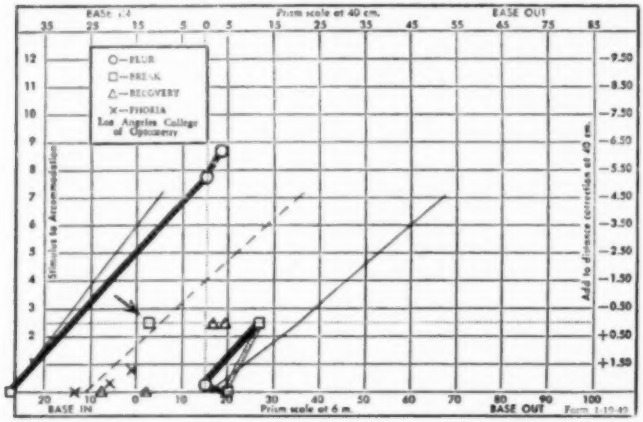
BASE IN
Prism scale at 40 cm.
BASE OUT
35 25 15 5 0 5 15 25 35 45 55 65 75 85
12 11 10 9 8 7 6 5 4 3 2
O—BLUR
□—BREAK
△—RECOVERY
×—PHORIA
Los Angeles College of Optometry
Stimulus to Accommodation
Add to distance correction at 40 cm.
−9.50 −8.50 −7.50 −6.50 −5.50 −4.50 −3.50 −2.50 −1.50 −0.50 +0.50 +1.50
20 10 0 10 20 30 40 50 60 70 80 90 100
BASE IN
Prism scale at 6 m.
BASE OUT

Fig. 5. The data of examination B showing #20 and #21 tests replotted as though taken through the subjective rather than through the No. 14B finding. The #17 finding (arrow) now appears to be of doubtful validity.

pearance, agreeing very closely with the final determination of the zone with the exception of only one finding, negative relative convergence at 16 inches. It will be noted that the phorias fall within 2 or 3 prism diopters of the final phoria line which, in view of their fluctuations, may be regarded as within the limits of normal variance.

It is interesting that the negative relative convergence at near finding approximately coincides with the final phoria line, indicating the probability that when the eyes reached the phoria position no further attempt was made to diverge them to maintain a single image, and actually no negative fusional convergence was elicited.

Examination C

Again insufficient data prevent the adequate mapping of the zone but a comparison of the findings with the final zone shows evidence of a shift of the entire zone at the time of this examination with a marked reduction in width of the zone. Comments by the examiner (see Table I-C) substantiate the conclusion that the patient was squinting at this time and that this is a manifestation of the shift and narrowing of the zone reported to be associated with intermittent strabismus.

Examination D

The most noticeable feature of this examination is the apparent increase in width of the zone at near and decrease at distance as compared with previous examinations. However, comparison of this graph with Figure 5 which we have shown to be a more probable representation of the earlier examination reveals that the width at the 2.50 D. level is very nearly the same for both examinations.

There is some evidence of a shift of the zone but it appears to be more pronounced for the distance findings than for the near ones. This may be regarded as a partial verification of the diagnosis which indicated the possibility of a deviation at distance but not at near. This shift of the zone for the distance findings results in an apparent reduction of the range of relative convergence at the zero level of accommodation and an apparent increase in the ACA ratio.

The low minus lens findings, falling on the phoria line, are again indicative of the difficulty in eliciting negative fusional convergence.

Examination E

The phoria line and the base-out side of the zone are in good agreement with the final findings but a constriction of the base-in side similar to that seen in examination B is again noted here, but to a lesser extent and manifest as a blur rather than a break. The earlier discussion may again apply to the negative relative convergence at near finding in this examination.

The slight restriction of the base-out side at the zero level is due to the low beginning-of-blur of the distance blur-out point finding. For a more direct comparison with the other examinations the criterion of blur-out should be used, inasmuch as the patient's response was usually elicited on that basis. The base-out side then appears parallel to that of the final zone.

Two phorias, the distance and near phoria with no Rx (#3 and #13A), are seen to coincide approximately with the base-in side of the zone, and appear to be entirely inconsistent with the other data of this examination. Each phoria appears to be shifted 11Δ toward the base-in side. Such a marked but uniform displacement is not satisfactorily accounted for by attributing it to unreliability or to the variability of the patient's response, since all other findings appear reasonably consistent and reliable. Instead, it suggests the presence of a causative factor which was not present when the other data were obtained. Although the habitual phorias were taken without lens power before the eyes, and the other data were obtained through the subjective, it is unlikely that the absence of the low plus lenses would cause an 11Δ increase

in the exophoria. It will be recalled that examination C revealed a series of phorias falling in approximately the same region as the habitual phorias of this examination, and that the patient was squinting throughout examination C. This would infer that the patient was squinting as the examination was begun, and that the squint disappeared prior to the taking of the other data. Thus the habitual phorias found in this examination may be considered to represent the *tropia* position rather than the phoria position.

Examination F

With the exception of the base-in finding at distance this examination appears to be generally comparable to the later delineation of the zone.

Examinations G and H

These two refractions were performed on the same day by two examiners and show excellent agreement as to results although individual findings differ considerably, which is indicative of the variability of the patient's response. Both examinations demonstrate the restriction of the base-in side of the zone at the 2.50 D. level although the restriction in examination G is apparent only as a blur rather than a break.

Examination I

This refraction was performed only two days prior to the final examination and the entire zone corresponds closely with the final determination of the zone, although the entire base-in side appears somewhat restricted.

Refractive Findings

The findings represented in Figure 3 serve to indicate that there was no consistent trend of the refractive data. The dynamic retinoscope at 16", unfused and fused cross cylinder near refractive findings, show extreme variations, but comparison with the other graphical data does not indicate any association. This inference is especially apparent if the data for examinations E and G are considered. In Figure 3 the E and G examination findings represent almost the opposite extremes, while in Figure 1 they are nearly identical. The static retinoscope and subjective distance refractive findings show no significant variation throughout the series of examinations.

Recoveries

Figure 4 reveals an apparently significant trend toward extension of the base-out recoveries at both distance and near. This results in a widening of the interval between the base-in and base-out recovery points and a consequent centering of the demand line (zero on the prism

scale) between them. A marked constriction of this interval and a displacement of both recovery points to the base-in side of the demand line is apparent in those examinations during which the patient was squinting (A. C. and D) but is also seen in examination F where all other findings were seen to be in good agreement with the final determination of the zone and there was no indication of the occurrence of a squint.

The apparent displacement of the near recoveries of examination B to the base-out side of the demand line and a reversal of their positions relative to each other is again indicative of the unreliability of the negative relative convergence finding in that examination.

CONCLUSIONS

Consideration of the series of examinations in the light of the foregoing observations indicates that:

(1) The position of the phorias did not change throughout the course of training (with the exception of those instances in the early examinations where the entire zone or a portion of it shifted and narrowed due to a manifest strabismus), but the phorias showed much less variability as training proceeded.

(2) The apparently high ACA ratio in the early examinations was a manifestation in some cases, of the variability of the phorias at that time, and in other cases was due to the shifting of the distance portion of the zone which accompanied the appearance of the squint. The observed change in slope of the phoria line may be attributed to the increased reliability and validity of the findings with training.

(3) Variations in the base-in side of the zone were due to a failure to elicit a maximum negative fusional convergence rather than an inability of the patient to maintain a single image while diverging her eyes.

(4) The base-out side of the zone showed no change although all later training was directed toward extending this side of the zone.

(5) There was no significant variation or trend in the distance static retinoscopic or subjective refractive findings. The near dynamic retinoscopic and crossed cylinder refractive findings showed great variation, but since the first and last examinations gave almost identical results, it cannot be assumed that these findings showed significant change. Also, it is apparent that the training did not improve the reliability of these tests.

(6) The recovery points showed a marked widening of the range between them, due particularly to the increase of the base-out recoveries. This is especially significant in view of the extensive base-out training

which the patient received but which produced no other demonstrable changes in the findings.

From this it appears that the relief of symptoms and elimination of the exotropia may be attributed to increase of the base-out recoveries and that the zone remains unaltered. However, this interpretation is a strictly mechanistic one and does not consider other (unmeasured) benefits which may have been derived from the training, such as improvements of fusion, stereopsis, facility of response, attention factor, etc. The source and type of these benefits have been suggested by Hofstetter[4] who has enumerated some of the functions of visual training as follows:

1. To train the patient to make reliable and valid observations and reports in the routine visual tests.
2. To teach the patient to tolerate ocular or visual conditions which are not subject to correction or which are unavoidably induced by the use of a necessary ophthalmic correction.
3. To develop perceptual skill along the lines of special needs.
4. To develop motor functions otherwise inadequate for maintaining normal vision.
5. As a psychological measure.

Hence it may be concluded that the increased range of recovery is a manifestation of changes occurring independent of the zone, encompassing and attributable to the functions outlined above, and that the beneficial results of the training may be ascribed to several or all of these functions, rather than to the increased recovery range alone.

SUMMARY

The results of nine clinical examinations of a patient exhibiting an intermittent alternating exotropia are presented in graphical form and are compared to a subsequent and more extensve determination of the zone of clear single binocular vision. These examinations show an apparent decrease in the ACA ratio, an apparent reduction of the distance exophoria, and apparently unequal variations in the range of relative convergence for different levels of accommodation during the course of training. Inspection and comparison of the individual examinations disclose that distortions of the zone are in most instances due to the lack of validity of certain findings, but in some instances may be the result of a shift of the position of the zone during portions of the testing. This shift is associated with the appearance of a manifest strabismus. The apparent decrease in the ACA ratio and reduction of the exophoria are attributed to the disappearance of this strabismic shift of the zone and to the increasing reliability and validity of the findings with training. No change is demonstrated in the refractive findings although the

near refractive findings show extreme variations in the various examinations. Training did not improve the reliabilty of these tests. The recovery findings show a marked increase, particularly on the base-out side. This increase is assumed to be representative of the improvement of other visual functions which are not directly measured in the routine examination procedure. The position, slope, and width of the zone remain essentially unchanged although the subjective and objective evidence of visual discomfort and the observed occurrence of an intermittent strabismus have been eliminated.

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[2]Hofstetter, H. W., The Zone of Clear Single Binocular Vision, American Journal of Optometry and Archives of American Academy of Optometry, Vol. 22, Nos. 7 and 8, August and September, 1945, pp. 301-333 and 361-384.

[3]Michaels, R. A., The Fundamentals of Modern Optometric Practice, Thesis presented to and published by the Los Angeles College of Optometry, June, 1939.

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REVIEW

GRAPHICAL ANALYSIS OF OPTOMETRIC FINDINGS. Charles Abel and H. W. Hofstetter, a Post-graduate Correspondence Course, Los Angeles College of Optometry, September, 1951, (mimeographed, $50.00).

This material, in fifty serial lessons with exercises to be completed by the correspondent, is intended for home and office study by the practicing optometrist. It deals with the graphical analysis of such optometric findings as the phorias, blurs, and breaks in terms of the criteria formulated by Sheard, Percival, Neumueller, Morgan, Fry, Borish, Maddox, and others, and their relationship to prescription of lenses, prisms, orthoptics, and visual training. Explanation is made of the five fundamental variables in the accommodation-convergence relationship and of the detailed handling of cases with such conditions as low or high A.C.A. ratios, low positive or negative fusional convergence, esophoria, exophoria, low amplitude of accommodations, squint, etc.

The first nine lessons deal with the very elementary phases of computation, definitions, and plotting of conventional findings. The next twelve describe the characteristics and phenomena of the graphically plotted optometric data. Twelve more relate to prescription procedure. Most of the remaining lessons deal with actual cases.

Completed exercises are corrected by members of the College staff and returned to the correspondent as progress is made.

CHARLES ABEL

THE RELATIONSHIP OF REFRACTIVE ERROR AND GUILFORD-MARTIN TEMPERAMENT TEST SCORES*

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There has been in the past considerable discussion on the relationship between personality and refractive error, although no correlation between these variables has been established. Basing their conclusions for the most part upon clinical observations, some authors have argued that refraction influences personality (classical view), and others that personality and temperament may influence the refractive state. The present paper is not concerned with this speculative phase of the problem, but rather is an attempt to determine by controlled experiment the degree of relationship of refractive error to specific personality traits.§

HISTORICAL ASPECTS

Godard,[1] writing primarily about uncorrected myopes, stated that these persons were optimistic, euphoric, and ardent in their actions; these characteristics were said to disappear when the patient began to wear correcting lenses. Harrison[2] observed that defective vision frequently produced a "bad mixer," a person who was introspective and more selfish than the majority of his friends. Gould,[3] in his description of the personality of the myope, uses such terms as meticulous, dogmatic, tyrannical, and egotistical.

The classical view is clearly stated by Thorington,[4] and more recently by Pimentel.[5] The myope, according to these authors, ranks high in school, is fond of books and music, tends toward reading, introversion and timidity, prefers interiors, and has a paucity of friends. The hyperope, on the other hand, is temperamentally the opposite of the myope, being the out-of-door type, extroverted, interested in athletics and has an abundance of friends. This same relationship between myopia and interest in books has been observed in children by Gesell, Ilg and Bullis,[6] who state that "Myopes frequently show a precocious

*Read before the annual meeting of the American Academy of Optometry, New York, New York, December 9, 1951. For publication in the January, 1952, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

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§The senior author expresses thanks to Dr. Donald Wilson for assistance in formulating the project and to Dr. Margaret Dowaliby for technical aid.

interest in books as early as 18 months or 2 years of age. . . . Introjection trends are uppermost. He gathers all the experience into himself, and he is in consequence better oriented within himself, but not so facilely oriented to his physical and social *milieu*. He is very demanding of people." It should be noted that myopia is rare in children before the age of six, and these authors do not make clear whether these children were already myopic, or whether these were children who developed myopia at a later age. Nichols[7] states that one "acquires his refractive error according to his own temperament and his approach to the surrounds in the environmental situation," also "one's manner or mode of visual perception is . . . closely allied to his manner and mode of thinking."

It may be stressed at this point that nowhere in the literature was a statistical basis encountered for the claims of relationship between refraction and personality or temperament. Thus, while the observations of the authors just enumerated are of interest, none can be said to have offered any proof for the existence of the relationship claimed. The present authors are aware of the many shortcomings in the study here described, but feel that it represents a first attempt to evaluate objectively the evidence for relationship between refraction and personality.

PRESENT EXPERIMENT

The Guilford-Martin (STDCR-GAMIN) Temperament Test* was administered to 119 students of the Junior Class at the Los Angeles College of Optometry. This was scored at the University of Southern California Vocational Advisement Center and the raw score was used in all calculations. A complete visual examination was performed by an optometrist on all subjects, and the average of the equivalent sphere correcting each eye was used as the measure of refractive error.

The coefficient of correlation was calculated for each of the 10 temperament traits and refractive state. These data are presented in Table 1, along with the probabilities that a value as high as the coefficient could have resulted from random sampling. (Fisher's Z method.)

If a probability of .05 be accepted as the criterion of statistical significance then variability of three of the personality traits seems to be associated with variability of refractive error. The degree of relationship is, however, very low; since r^2 expresses the associated variance, it is seen that 3.2, 4.0, and 5.8 per cent of variability in traits R, G, and A respectively is associated with variability in refractive state.

*See Appendix.

DISCUSSION

From the author's description of factors R, G, and A of the Guilford-Martin Test, the following tendency for association between personality type and refractive state may be noted:

Myope: Inhibited disposition and over control of the emotions (Low score in trait R).

Inertness and disinclination for motor activity (Low score in trait G).

Social leadership (High score in trait A).

Hyperope: Happy-go-lucky or carefree disposition, liveliness, impulsiveness (High score in trait R).

Engages in vigorous activity (High score in trait G).

Social passiveness (Low score in trait A).

TABLE 1

Correlation Coefficients between refractive state and each of 10 Personality Trait Scores

Trait		Correlation r	P
S	Social Introversion-Extraversion	—0.10	.28
T	Thinking Introversion-Extraversion	—0.14	.13
D	Depression	+0.01	.91
C	Cycloid disposition	+0.09	.33
R	Rhathymia	+0.18	.05
G	General Activity	+0.20	.03
A	Ascendance - Submission	—0.24	.01
M	Masculinity - Femininity	+0.11	.24
I	Inferiority Feelings	+0.06	.52
N	Nervousness	—0.04	.67

These tendencies are in general agreement with the classical view described in the introduction. However, the degree of association is so slight as to be of almost no predictive value. Furthermore, the evidence here presented cannot be used in determining the cause of refractive errors. It is equally reasonable to assume that (a) the near-sighted child by reason of his handicap, becomes disinclined toward motor activity or (b) the child who is disinclined to motor activity will turn to reading and hence develop myopia. The problem depends upon the presence of a physiological mechanism for the second alternative, and thus far, such a mechanism has not been demonstrated.

APPENDIX

The 10 factors measured by the Guilford-Martin (STDCR-GAMIN) Temperament Test are described by its authors as follows:

S—Social Introversion-Extroversion.—A high C-score (low raw) indicates sociability, a tendency to seek social contacts and to enjoy the company of others. A low C-score (high raw) indicates shyness, a tendency to withdraw from social situations and to be seclusive. A high C-score (low raw) is more desirable for mental

health than is a low C-score (high raw). A very low C-score (high raw) on S indicates a need for guidance directed toward social participation.

T—Thinking Introversion-Extroversion.—A high C-score (low raw) indicates a lack of introspectiveness and extrovertive orientation of the thinking process. A low C-score (high raw) indicates an inclination to meditative thinking, philosophizing, analyzing one's self and others, and an introspective disposition. The middle range of C-score is more desirable for mental health than either extreme on trait T. Each extreme, however, may have its value for certain types of occupation.

D—Depression.—A high C-score (low raw) indicates freedom from depression a, cheerful, optimistic disposition. A low C-score (high raw) indicates a chronically depressed mood including feelings of unworthiness and guilt. The higher the C-score on trait D, the better is likely to be the emotional adjustment of the individual.

C—Cycloid Disposition.—A high C-score (low raw) indicates stable emotional reactions and moods, and freedom from cycloid tendencies. A low C-score (high raw) means the presence of cycloid tendencies as shown in strong emotional reactions, fluctuations in mood, and a disposition toward flightiness and instability. The higher the C-score on trait C, the better will be the emotional adjustment of the individual, except that scores that are too high may indicate a colorless, inert individual.

R—Rhathymia.—A high C-score indicates a happy-go-lucky or carefree disposition, liveliness, and impulsiveness. A low C-score indicates an inhibited disposition and an overcontrol of the impulses. Both extremes of C-scores may represent psychological maladjustments and a C-score in the middle range is desirable for mental health.

G—General Activity.—A high C-score indicates a tendency to engage in vigorous over action. A low C-score indicates a tendency to inertness and disinclination for motor activity. An extremely high C-score on trait G may represent a manic tendency while an extremely low C-score may be an indication of a hypothyroid condition or other causes of inactivity. Thus, for good mental health a C-score on G in the middle range is usually most desirable.

A—Ascendance-Submission.—A high C-score indicates social leadership and a low C-score social passiveness. The C-score of a person on Trait A must be interpreted in the light of his other characteristics of temperament as shown on the profit chart, and no general rule can be set forth as to what C-scores on trait A are most desirable for mental health. However, there is emphasis in our culture on the general desirability of a high C on trait A. Females tend to have distinctly lower C-scores on A than do males.

M—Masculinity-Femininity.—A high C-score on this trait indicates masculinity of emotional and temperamental make-up and a low C-score indicates femininity. The C-scores of the majority of males are above 5 and the majority of females have C-scores below 5. Males whose C-scores are very low are sometimes found either to lack their full quota of male hormones or to have an oversupply of female hormones.

I—Inferiority Feelings.—A high C-score indicates self-confidence and a lack of inferiority feelings. A low C-score indicates a lack of confidence, under-evaluation of one's self, and feelings of inadequacy and inferiority. The higher the C-score on trait I, the better for mental health, with the exception of extremely high cases in which clinical investigation may reveal a superiority compensation for hidden inferiority feelings. Many psycho-neurotics have very low C-scores on trait I.

N—Nervousness—A high C-score indicates a tendency to be calm, unruffled, and relaxed; a low C-score indicates jumpiness, jitteriness, and a tendency to be easily distracted, irritated, and annoyed. The higher the C-score on trait N, the better for mental health unless there are clinical indications that an overly sluggish and torpid condition is the basis for an extremely high C-score. Extremely low C-scores in some cases may involve a lack of calcium in the blood. In many cases, a mental conflict may be the basis for the emotional tension expressed in jitteriness and irritability.

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BOOK REVIEW

GENETICS IN OPHTHALMOLOGY. Arnold Sorsby, C. V. Mosby Co., St. Louis. 1951. $9.50.

This is the first adequate coverage of what is known and unknown concerning the inheritance of ocular traits. In 251 pages and 233 figures with 20 illustrations in color, Sorsby subdivides his subject into three sections. The first considers such basic concepts as modes of inheritance, gene mechanisms, environment and pedigree symbols.

Sorsby classifies genetic affections into seven categories: congenital anomalies, abiotrophies, phakomatoses closely related to tumors, neoplasms, metabolic disorders, functional anomalies and syndromes. Section I ends by presenting experimental and clinical observations relating to the prospects of controlling genetic disease.

Isolated ocular traits such as eyeball size, glaucoma, individual components of refraction, myopia, hyperopia, aniseometropia and anomalies of ocular movement are intelligently reviewed in Section II. Numerous corneal conditions are considered and illustrated with slit lamp figures. Hereditary diseases of the lens, uvea, retina and optic nerve are well handled. Finally, the ocular appendages, fibrous coat and vitreous are discussed.

Section III deals with generalized disorders having ocular aspects. Metabolic disorders include alkaptonuria, albinism, Tay-Sachs amaurotic idiocy, xanthomatosis and gargoylism. Numerous ocular traits associated with skeletal abnormalities are listed. Many inherited nervous and dermatological diseases are shown to have ocular manifestations. Lastly skeletal, vascular, neural and dermatological syndromes with ocular aspects are treated.

In the discussion of albinism, one misses a more complete biochemical analysis of why melanin cannot be formed. In the last chapter it is not clear why he classifies phakomatoses as "predominately neuro-ectodermal" syndromes when mesodermal elements in the connective tissue of nerves are primarily involved in neurofibromatosis (von Recklinghausen's disease). Again in some of the other phakomatoses it is mesodermal blood vessels that are predominantly affected.

Schools that desire to offer a course in ocular genetics will find this a useful textbook, and any professional person eager to understand the mechanism of ocular inheritance will find it a convenient source of reference.

HARRY A. JANKIEWICZ.

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THE ACADEMY TODAY*

We have just concluded the thirtieth year of Academy activity in optometry. It has been a year, like many others, in which this organization has been able to contribute much to the profession's well-being. Again we have made substantial grants-in-aid to research projects. Our educational program as evidenced by the Academy Journal and by the many widely distributed Academy monographs is meeting far spread acceptance. In the field of interprofessional relationships we have played an important part in the work of the National Interprofessional Committee on Eye Care and as Academy members, we all can, and will,

*Excerpts from the Annual Report of the Secretary. Read before the annual meeting of the American Academy of Optometry, December 8, 1951, New York, New York. For publication in the January, 1952, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

assist the American Optometric Association in securing country-wide adoption of the Code of Practice of the A. O. A., thus further eliminating the commercial practices which are a detriment to public health.

The Academy sections are setting the quality of technical excellence expected of well-trained optometrists who practice in the optometric specialties. This meeting, arranged by the Sections and the Papers and Program Committee, will again demonstrate the value of skilled leadership in the field of ocular science.

These things do not "just happen." Much planning and preparatory work makes these achievements possible. Under the splendid leadership of President Harold Simmerman and the members of the Executive Council, the Academy has concluded another successful year, and members of the Academy everywhere may be proud of their organization.

We are pleased to welcome to these sessions, the officers and trustees of the A. O. A., the members of the National Board of Examiners in Optometry, the members of the National Interprofessional Committee on Eye Care, the Association of Schools and Colleges in Optometry, the members of the American Board of Opticianry, and the officers of the Association of Military Optometrists of the United States—all of whom are having special organizational meetings here in New York City before, or during, the sessions of the Academy.

ACADEMY MEMBERSHIP

Since our last meeting at Chicago, Illinois, Academy fellowship certificates have been issued to 58 optometrists, educators and scientists. On December 1, 1951, the membership of the Academy numbered 568.* This is the high point in Academy membership, but this number falls far short of the total number of optometrists who are eligible and who should become Academy members. Members of the Academy will confer a favor in proposing their associates and fellow practitioners for membership.

Since our last meeting, I regret to report that the Academy has lost five members through death. Each of these men played a significant part in the development of the profession, and each has left his important mark upon optometry. All have been active in the Academy. We miss these important leaders, and at this time we pause to pay tribute to: Dr. Clarence M. Baker, Brandon, Vermont; Dr. Robert F. Downs, South Pasadena, California; Dr. George Joseph Haus, Memphis, Tennessee; Dr. Lewis H. Kraskin, Washington, D. C.; and Dr. R. F. Pray, Lufkin, Texas.

*New members of Academy, accepted at New York City meeting, listed on page 48.

During this same period, the Academy accepted with regret the resignations of Dr. Leo W. Bannon, Flushing, New York; Dr. Denny W. Jones, Chester, Pennsylvania; Dr. Joseph V. E. Lennon, South Bend, Indiana; Dr. H. Harrison Peters, Cleveland, Ohio; Dr. Richard M. Shindler, Vineland, New Jersey; and Dr. G. H. Whiteside, Akron, Ohio.

THE COMMITTEE ON ADMISSIONS

Under the able direction of Dr. Arthur P. Wheelock, Des Moines, Iowa, the Committee on Admittance and their regional committees have done excellent work. During the period covered by this report the Academy has received 64 applications, and is now working with these applicants to bring them into the Academy. The work of this important group is functioning most smoothly, and Dr. Wheelock and his committee deserve the sincere thanks of the entire membership. The Regional Chairmen assisting Dr. Wheelock are Dr. Oscar L. McCulloch, Holyoke, Massachusetts, Region 1; Dr. Arthur S. Kitchen, Clearwater, Florida, Region 2; Dr. E. E. Reese, Westerville, Ohio, Region 3; and Dr. Otto J. Bebber, Denver, Colorado, Region 4. As of December 1, 1951, 123 active applications for fellowship are on file with the committee.

PAPERS AND PROGRAM COMMITTEE

Since last Spring the Papers and Program Committee and the Section Chairmen have been arranging the program to be presented here in New York City. These men have done a splendid job under the leadership of Dr. Meredith W. Morgan, Jr., Berkeley, California, assisted by Dr. I. M. Borish, Kokomo, Indiana; Dr. Isidore Finkelstein, New York City; Dr. Henry W. Hofstetter, Los Angeles, California; and Dr. F. W. Sinn, Philadelphia, Pennsylvania. The Section Chairmen who will conduct their individual section meetings are *Aniseikonia*, Dr. Leo Madigan, Boston, Massachusetts; *Contact Lenses*, Dr. John C. Neill, Philadelphia, Pennsylvania; *Occupational Vision*, Dr. Richard Feinberg, Chicago, Illinois; *Orthoptics*, Dr. J. Donald Kratz, Souderton, Pennsylvania; *Pathology*, Dr. William O. Vivian, Media, Pennsylvania.

Through the efforts of this group, a number of outstanding original papers will be presented to this gathering, and the entire profession is indebted to the speakers we will hear from at this annual convention of the Academy. The complete list of speakers appears in the program, and their papers will later be presented to the profession through the Academy Journal.

RESEARCH PROJECTS

During 1951 grants-in-aids by the Research Projects Committee

assisted studies conducted at Columbia University and The Ohio State University, and made possible the publishing of the monograph by Dr. Gordon L. Walls of the School of Optometry, University of California, "The Problem of Visual Direction." Dr. Meredith W. Morgan, Jr., Berkeley, California, will report in greater detail on these grants.

CHAPTERS

The start of 1951 found the Academy with 20 active local chapters. During the year, an application for a new chapter was received from Delaware. This application has been approved by the Executive Council, and we now have 21 chapters serving the membership at the local level.

FISCAL POSITION OF THE ACADEMY

Following the 1950 meeting, the Secretary's office prepared the 1951 Annual Budget which has been followed throughout the year. The Secretary's report to the membership in the form of the Academy Balance Sheet of November 10, 1951, reported the current fiscal position of the Academy. I am pleased to report to the membership that the finances of the organization are adequate to meet the minimum current requirements.

CONCLUSION

In closing this annual report, I wish to briefly review some of the national projects in which we in the Academy have played a part. In these we have worked in close harmony with the American Optometric Association, and the relations between the two organizations have never been better. The A. O. A. is doing a magnificent job in getting its constituent State Associations to adopt, in full, its Code of Practice, and in so doing, has taken a forward position which will help in eradicating many of the remaining commercial aspects of optometry. This new code of practice makes continuing the 31 year Academy effort for professional practice in optometry much easier, and assures us that the desired goal of full professional practice may soon be achieved.

Another outstanding development has to do with professional consultation between optometrists and ophthalmologists. Through the efforts of the National Interprofessional Committee on Eye Care, the door is now open to more helpful and proper professional consultation which will immeasurably improve the type of eye care supplied the public.

Another activity has to do with students' deferment. This Selective Service program has kept student enrollment of optometric colleges at its present more-or-less satisfactory level. The American Optometric

Association was responsible for securing the legislation which made the program possible, and your Secretary, along with Dr. J. Babcock of Portsmouth, Ohio, and Mr. William MacCracken of Washington, D. C., has sat through the many meetings and conferences which developed the Selective Service regulations upon which the nation's draft boards function.

In closing this annual report, I wish to express my sincere appreciation to the Executive Council, the standing committees, Sections and Chapters of the Academy. All have been most cooperative and helpful, and have made the conduct of the Secretary's office a real pleasure. I particularly wish to express my appreciation to our President, Dr. Harold Simmerman, for his constructive assistance and ever present leadership. We have been in daily contact, and he has never permitted his many other duties to interfere with his Academy responsibilities.

The work done by the Academy over the years is showing very major results. The professional future of optometry never looked brighter. The loyal membership of the Academy may well feel proud of the important part they have played in placing optometry in the accepted group of major health professions.

CAREL C. KOCH

TRANSACTIONS OF THE AMERICAN ACADEMY OF OPTOMETRY

A department devoted to announcements, reports, appointments, organization data, news, professional problems and ideals, as these relate to the Academy.

NEW YORK CITY ANNUAL MEETING OF ACADEMY

December 8, 9, 10 and 11, 1951
Hotel New Yorker

Report by Virginia Huck, Editorial Assistant

The American Academy of Optometry held a convention unusual and outstanding in many respects during December. Fellows who attended soon became aware of many things as they attended lectures and talked to other Academy members. They became aware of the fact that the Academy is growing, and with its growth is assuming an even greater sense of responsibility and strength in the eye care field. That progress in research, interprofessional relations, and standards of practice, as advocated by the Academy, is being made gradually, in spite of some still unsolved problems.

Registration at the convention, which was held in the Hotel New Yorker, was high: more than 200 optometrists, educators and scientists registered, and in addition, nearly 100 students of the School of Optometry, Columbia University, attended the lectures as guests of the Academy. Many Fellows of the Academy were invited guests at special meetings being held concurrently, which afforded new opportunities of discussing mutual problems. At many of the lectures arranged by Dr. Meredith W. Morgan, Jr., and his papers and program committee, it was "standing room only." In short, interest in the Academy and its affairs reached a new high at this annual meeting.

ACADEMY HONORS DR. WILLIAM L. BENEDICT WITH LIFE FELLOWSHIP

Dr. William L. Benedict, internationally known ophthalmologist, was awarded an Honorary Life Fellowship by the American Academy of Optometry December 10, 1951, at its annual meeting in New York. The award, the fifth to be presented by the Academy,* was made to Dr. Benedict in recognition of his outstanding contributions to the field of visual science, and particularly for his untiring efforts to bring about a closer relationship between the eye professions toward the ultimate goal of better eye care for the public.

The Fellowship certificate was presented to Dr. Benedict at the annual formal roundtable banquet, by President Harold Simmerman, who, before presenting the award, told the audience of more than 200,

"In introducing you to our honored guest, I cannot possibly tell you about all of his many honors—they fill many pages in our literature. His shoulders are broad and he has carried interprofessional problems on them for many, many years. He is one of the outstanding ophthalmologists in our country, and in the words of his own colleagues, 'a brilliant surgeon, an outstanding organizer and executive, a true friend of all who are working for better eye care for the public, and a man of the keenest judgment and highest integrity.' "

Dr. Benedict's organizational work has included not only that of Director of the Section on Ophthalmology at the Mayo Clinic, but also work in many other important fields of ophthalmology. He was one of the organizers of the Association for Research in Ophthalmology, and has done all within his power to stimulate research both here and abroad, through his association with ophthalmological groups, including the Pan American Association of Ophthalmology in which group

*Prior awards presented to Dr. A. W. Smith, Dean, Graduate School, The Ohio State University, Columbus, Ohio. Dr. James P. C. Southall, Charlottesville, Virginia, formerly of Columbia University, New York City. Dr. Frederic A. Woll, New York City College, New York City, and Dr. Julius Neumueller, Pennsylvania State College of Optometry, Philadelphia, Pennsylvania.

he now serves as vice president.

His official memberships include the American Academy of Ophthalmology and Otolaryngology, Fellow of the American College of Surgeons, American Association for the Advancement of Science, American Medical Association, American Ophthalmological Society, International College of Surgeons, Association for Research in Ophthalmology, Minnesota Academy of Medicine, Minnesota Academy of Ophthalmology and Otolaryngology and Sigma Xi. In addition he is an honorary member of Societies in Illinois, Texas, Oklahoma, Nebraska, the Philippine Islands and Cuba.

Dr. Benedict's contributions to the literature consist of more than 200 scientific papers, reviews and articles published in journals, cyclopedias and textbooks. He has served on the editorial boards of the *A.M.A. Archives of Ophthalmology* and *American Journal of Ophthalmology*. He is currently Editor in Chief of the *Transactions of the American Academy of Ophthalmology and Otolaryngology*, and also secretary of the Academy. He is also a member of the editorial boards of the *Journal of the American Medical Sciences, Quarterly Review of Ophthalmology and Otolaryngology, Ophthalmologia Ibero-Americana*, Ophthalmology Section XII of *Excerpta Medica*, and a contributor to *Encyclopedia Brittanica Book of the Year*.

To go back a few years to Dr. Benedict's early life—he is a graduate of the University of Michigan, Department of Medicine and Surgery, which is now the University of Michigan Medical School, class of 1912. He spent two years as assistant in the department of ophthalmology, University Hospital, Ann Arbor, and in the private office of Professor Walter R. Parker, Detroit. In 1914, he started a practice in Fresno, California, but three years later moved to Rochester, Minnesota, as head of the Section on Ophthalmology of the Mayo Clinic, where he remained until he was retired in 1950. From 1919 to 1951, he taught ophthalmology in the Graduate School of the University of Minnesota, Mayo Foundation.

His intense interest in the prevention of blindness led him to recognize the need for closer relationship between the professions, and he has devoted a great deal of time toward bringing this about. He is a vice president and director of the National Society for the Prevention of Blindness, a member of the Advisory Committee of the Medical Film Institute of the Association of American Medical Colleges, and chairman of the educational advisory committee of the American Board of Opticianry. He is also secretary-general of the XVII International Congress of Ophthalmology which will convene in New York in September,

1954. The Leslie Dana Medal for the Prevention of Blindness was awarded Dr. Benedict in 1950.

As a representative of the Section on Ophthalmology to the House of Delegates of the American Medical Association, Dr. Benedict has watched the progress toward better eye care, and in this capacity has fought for the advancement of public health.

In accepting the Academy Life Fellowship, Dr. Benedict—a tall, square shouldered man—expressed his appreciation in his quiet, direct manner: "I can only tell you how deeply I appreciate the honor by reminding you that I am only an agent of a large group that has worked for the advancement of our professional work—doing what we can for suffering humanity. It is only a matter of timing that I am receiving the award instead of many men who are trying to resolve the problems deterrent to our objectives. I think this is the culmination of one of the greatest efforts with which I have ever been associated. I therefore accept this honor on behalf of all those men. I thank you from the bottom of my heart."

DR. HAROLD SIMMERMAN ELECTED PRESIDENT

Dr. Harold Simmerman, Woodbury, New Jersey, was re-elected president of the Academy at the annual election December 10. During the first year under his leadership the Academy took many important steps forward in both growth and in the field of interprofessional relationships. Dr. Simmerman holds claim to many titles—educator, practicing optometrist, civic leader, author, inventor. He practices in Woodbury, New Jersey, and teaches at Pennsylvania State College of Optometry. He has held innumerable offices in optometric and civic organizations: is married and has two sons, Martin 15, and Steven John, 11.

In accepting the presidency for 1952, Dr. Simmerman said, "It is with a very humble heart that I accept this honor from the American Academy of Optometry. I will do everything in my power to keep the organization strong and maintain its high ideals." He pointed out also that the strength of the Academy resides in the simple, homely basic principles that make Academy policy.

EXECUTIVE COUNCIL

The following Fellows will serve on the Executive Council with President Simmerman in 1952:

Dr. Robert E. Bannon, vice president, Southbridge, Massachusetts: Dr. Daniel G. Hummel, Cleveland, Ohio, past president: Dr. Carel C. Koch, Minneapolis, Minnesota, secretary-treasurer: Dr. Lawrence Fitch, Philadelphia, Pennsylvania: Dr. J. D. Perry, Jr., Winston-Salem, North

Carolina: Dr. R. W. Tubesing, Richmond, Indiana, and Dr. Ralph E. Wick, Rapid City, South Dakota. Ex officio members reappointed to the Council include Dr. Harold Fisher, New York, New York, chairman, editorial council; Dr. Meredith W. Morgan, Jr., Berkeley, California, chairman, papers and program committee, and Dr. Arthur P. Wheelock, Des Moines, Iowa, general chairman, committee on admittance.

EXECUTIVE COUNCIL ACTIONS

Several significant actions were taken by the Executive Council, on behalf of the Academy, during the New York sessions. In brief, the Council

*Approved the following resolution relative to the Academy and the American Optometric Association:

Whereas: The American Optometric Association, with its affiliated State and local associations, constitutes the first line of defense for optometry without which the profession rapidly would suffer irreparable injury if not complete disintegration. Now therefore be it

Resolved: That we as Fellows of the American Academy of Optometry in the annual meeting assembled hereby go on record as favoring the closest association with the American Optometric Association and its affiliated State and local associations, and be it further

Resolved: That only under very exceptional circumstances should an Academy Fellow actively engaged in practice in the U. S. A., be considered free from obligation of membership in his local, State, and the American Optometric Association.

*Approved the following resolution on standardization of measuring systems:

(1) Whereas in the practice of optometry, also in the scientific publications and discussions in optometry, there is a certain amount of confusion due to the indiscriminate use of two systems of measurements, i.e., the metric system (of meters, cm., mm.) and the so-called English system (feet and inches) and

(2) Whereas the English system is used, partially, only in the English speaking countries of the world, and

(3) Whereas the increasing collaboration among the practitioners of different countries makes it very desirable to have a uniform code of recording optometric findings, and therefore a common unit of measurement, therefore be it resolved:

(1) That the American Academy of Optometry recommends to its members the adoption of the metric system exclusively in all their optometric and ophthalmic work and recordings:

(2) that the members use their influence to encourage optometrists and others generally to adopt the metric system, and

(3) that the American Academy of Optometry in all its publications, announcements, courses, etc., adopt the use of the metric system of notation.

The Council also went on record

*Authorizing its committee on chapters to review the constitution and by-laws of all chapters to assure fullest conformity with similar provisions in the Academy Constitution and By-laws.

*Requiring that action on applicants at the chapter level be on a majority vote basis, entirely eliminating the secret ballot where in use by chapters. In connection with this action the Council reiterated that the only requirements for Fellowship are professional practice, ade-

quate graduate and undergraduate professional training, and scientific ability.

*Authorizing the formation of a committee within the orthoptic section to study the various theories and causes of strabismus, and to prepare a report on this for the Rochester meeting.

*Authorizing the formation of a committee to study the whole question of reading training, and the part optometry should play in this work, and to prepare a report on this for the Rochester meeting.

ANNUAL ROUNDTABLE BANQUET

Dr. Rudolph Ehrenberg, Granite Falls, Minnesota optometrist, Fellow of the Academy, and recently elected president of the National Examining Board in Optometry, was the principal speaker at the annual roundtable banquet held in the Grand Ballroom of the Hotel New Yorker. Dr. Ehrenberg, in his talk, discussed the activities of the Board since its formation at the June, 1951, A. O. A. congress, and outlined the objectives and future plans of the board. The entire text of this speech will be published in a coming issue of the Journal.

NEW YORK ACADEMY GIFT

A check for $200.00 was presented to the American Academy of Optometry at the annual banquet by the New York Academy of Optometry, for research purposes. Dr. Edward Steinberg, New York Academy president, presented the gift to President Harold Simmerman, who expressed the thanks of the Academy to the New York group.

BANQUET GUESTS

The American Academy of Optometry was honored with the presence of several leaders in the eye care field at its annual banquet: At the head table were Dr. Meredith W. Morgan, Jr., chairman, Academy papers and program committee; professor of optometry, School of Optometry, University of California. Mr. Leslie Myers, past president, Independent Optical Wholesalers Association; president, American Board of Opticianry; vice president, National Interprofessional Committee on Eye Care. Dr. Avery D. Prangen, senior ophthalmologist, Section on Ophthalmology, Mayo Clinic, Rochester, Minnesota; professor of ophthalmology, School of Medicine, University of Minnesita; chairman, National Interprofessional Committee on Eye Care. Dr. J. Ottis White, president, American Optometric Association. Dr. Rudolph Ehrenberg, president, National Examining Board in Optometry. Dr. Harold Simmerman, toastmaster and President, American Academy of Optometry. Dr. William L. Benedict, guest of honor. Dr. James Wahl, first vice president, American Optometric Association. Dr. Franklin M. Foote, executive director, National Society for the Prevention of Blind-

ness: member, National Interprofessional Committee on Eye Care. Dr. Edward L. Steinberg, president, New York Academy of Optometry; faculty member, School of Optometry, Columbia University. Dr. Conrad Berens, director, Ophthalmological Foundation, New York; past president, American Academy of Ophthalmology; chairman, American Committee on Optics and Visual Physiology; member, American Board of Ophthalmology.

PAPERS PRESENTED

An exceptionally fine papers program was presented to the Academy in New York by Dr. Meredith W. Morgan, Jr., and his papers and program committee. The following optometrists, ophthalmologists and educators presented papers which will be published in this Journal in coming months:

Dr. William G. Walton, Jr., Pennsylvania State College of Optometry, Philadelphia, Pennsylvania; Dr. Henry Knoll, Los Angeles College of Optometry, Los Angeles, California; Dr. Vincent Ellerbrock, School of Optometry, The Ohio State University, Columbus, Ohio; Dr. Robert E. Bannon, Bureau of Visual Science, American Optical Company, Southbridge, Massachusetts; Dr. Isidore Finkelstein, School of Optometry, Columbia University, New York, New York; Dr. Joseph Pascal, New York, New York; Dr. Robert Harrigan, School of Optometry, University of California, Berkeley, California; Dr. Isadore Kaplan, Pennsylvania State College of Optometry, Philadelphia, Pennsylvania; Dr. Eugene Freeman, Chicago College of Optometry, Chicago, Illinois; Dr. William Smith, Massachusetts College of Optometry, Boston, Massachusetts; Dr. Harold Simmerman, Pennsylvania State College of Optometry, Philadelphia, Pennsylvania; Dr. Irving Vics, Albany, New York; Lieutenant Colonel Elwin Marg, School of Optometry, University of California, Berkeley, California; Dr. Max Schapero, Los Angeles College of Optometry, Los Angeles, California; Dr. William Schumann, Vineland, New Jersey; Dr. Monroe J. Hirsch, Los Angeles College of Optometry, Los Angeles, California; Dr. Thaddeus R. Murroughs, Northern Illinois College of Optometry, Chicago, Illinois; Dr. Meredith W. Morgan, Jr., School of Optometry, University of California, Berkeley, California; Dr. Henry Hofstetter, Los Angeles College of Optometry, Los Angeles, California.

SECTION MEETINGS

The new section on occupational vision held its first meeting in New York City, with chairman, Dr. Richard Feinberg in charge. A great deal of interest was shown in the program offered by the section and meetings were well attended. The occupational vision section, and the orthoptics, contact lenses and aniseikonia sections held their meetings Sunday, Monday and Tuesday mornings from 9 to 11 A.M. The pathology section was open to all, and lectures ran from 11 A.M. to noon. Speakers and topics at the section meetings were as follows:

Section on Aniseikonia, Dr. Leo F. Madigan, chairman:

Dr. Robert E. Bannon, Southbridge, Massachusetts, "The Effect of Aniseikonia on Depth Perception;" Dr. Harold Fisher, New York City, "Oblique Astigmatism and Aniseikonia;" Dr. Paul Haynes, "Techniques of Examination Problems in the Design and Manufacture of Iseikonic Lenses." Case reports were presented by Dr. Benton C. Freeman, Allentown, Pennsylvania; Dr. Oscar McCulloch, Holyoke, Massachusetts and Dr. Paul Connolly, Detroit, Michigan.

Section on Orthoptics, Dr. J. Donald Kratz, chairman:

Sunday: Dr. Daniel Woolf, Columbia University School of Optometry. "Demonstration of Clinical Procedures for Orthoptic Training." This talk included a discussion of means used to differentiate an absolute scotoma as opposed to an amblyopia. The training of peripheral fusion was demonstrated. Dr. Thaddeus Murroughs outlined his recent findings concerning anomalous correspondence. Monday: Dr. Max Schapero, Los Angeles College of Optometry. "A Comparison of Some Theories of Squint Treatment." This talk led to a decision by the orthoptics section to instigate a committee to standardize the present testing procedures in an effort to place the treatment of heterotropias on a sounder basis. Tuesday: Dr. Esther Ingram, Winter Haven, Florida. "A Study of Alternate Binocular Stimulation With Flicker." Case reports submitted by Dr. Arthur Jampolsky, San Francisco, Dr. Kratz, and Dr. Eli Pronchick, Philadelphia, Pennsylvania, were read.

Section on Contact Lenses, Dr. John C. Neill, chairman:

Dr. I. Irving Vics, Albany, New York. "A Case of Alternating Exotropia Corrected with Contact Lenses." Special reports on actual contact lenses cases by Dr. S. G. Weiss, Torrington, Connecticut; Dr. William Policoff, Wilkes-Barre, Pennsylvania; Dr. Arthur G. Hoare, Los Angeles, California; Dr. Daniel G. Hummel, Cleveland, Ohio, and Dr. Nathan A. Robbins, Buffalo, New York. Dr. Bernard J. Mazow, Houston, Texas. "A Case of Conical Cornea Fitted with Moulded and Corneal Lenses." Dr. Eugene Freeman, Chicago, Illinois. "Pin Hole Contact lenses." Dr. John C. Neill, Philadelphia. "Personal Observations on Contact Lens Fitting in England." Dr. William Feinbloom, New York City. "Important Considerations in the Fitting of Corneal Lenses." Special reports on teaching contact lens fitting in optometric schools by Drs. Isidore S. Finkelstein, Columbia University; Eugene Freeman, Chicago College of Optometry; Henry Hofstetter, Los Angeles College of Optometry; Richard Feinberg, Northern Illinois College of Optometry; Vincent Ellerbrock, The Ohio State University; Russell Manwiller and John C. Neill, Pennsylvania State College of Optometry, and Meredith W. Morgan, University of California.

Section on Occupational Vision, Dr. Richard Feinberg, chairman:

Problems of organization, and appointments of sub-committees were discussed, and the results of these discussions will be published later. Papers were presented by Dr. Charles Bridgman, Madison, Wisconsin, on "Occupational Aspects of Vision from the Industrial Psychological Viewpoint:" Mr. Sylvester K. Guth, Cleveland, Ohio, "A Broad Concept of Lighting on the Job;" Dr. Gideon Lang, Concord, North Carolina, "An Industrial Vision Program:" Mr. R. A. Sherman, "A History of Industrial Vision:" Commander R. Rosswell Sullivan, "Optometry in the Navy." Members of the section toured the Sperry Gyroscope Company at Lake Success, and heard brief talks at the plant by Dr. Raymond Murray, medical director; Dr. Herman Sager, director of eye service, and Mr. Fred Kiefer, safety engineer.

CHICAGO, ILLINOIS, 1953 CONVENTION CITY

Upon recommendation of the time and place committee, Chicago, Illinois, was approved by the Academy as the 1953 convention city. Tentatively, plans have been completed for the meeting to be held in the Drake Hotel the early part of December. The exact dates for 1953 will be announced. Dr. Arthur Kitchen is chairman of the time and place committee.

1952 CONVENTION TO MEET IN ROCHESTER, NEW YORK

The 1952 annual meeting of the Academy will be held in Rochester, New York, at the Seneca Hotel, December 6-9, 1952. During the meeting at Rochester the Academy will pay tribute to the 100th anniversary of the founding of the Bausch & Lomb Optical Company.

CHAPTER LUNCHEON

A total of 56 Fellows attended the annual chapter luncheon and heard brief reports of chapter activities from representatives of the Academy's 21 chapters. Dr. Lawrence Fitch, chapters committee chairman, Pennsylvania State College of Optometry, arranged for and presided over the luncheon.

Dr. Fitch presented the most recently organized group, the Delaware chapter, its charter, which was accepted by Dr. Preston West, Georgetown, president. Dr. H. I. Moss, Wilmington, is the chapter secretary, and Dr. S. Winfield Smith, Wilmington, treasurer.

A suggestion was made by the New Jersey Chapter that members of all local chapters should be encouraged to write and present papers at their meetings and also at the annual meeting of the Academy. It was pointed out that the New Jersey Chapter presents a special travel grant-in-aid for those of its members who present papers at annual meetings of the Academy. The report of the New Jersey Chapter was presented by Dr. George McEneany, Asbury Park, New Jersey.

COMMITTEE APPOINTMENTS AND REPORT OF PRESIDENT

The annual report of the President of the Academy, as presented at the annual meeting, will be published next month, as will the committee appointments made by President Simmerman.

NEW MEMBERS OF THE ACADEMY

The following optometrists and educators were elected to Fellowship in the American Academy of Optometry during the quarter ending December 31, 1951. The Academy welcomes these new members.

Dr. William L. Benedict, Rochester, Minnesota. Honorary Life Fellow.
Dr. Harold R. Barnes, School of Optometry, Columbia University, New York, New York.
Dr. Leonard Bronstein, Northern Illinois College of Optometry, 4170 Drexel Boulevard, Chicago, Illinois.
Dr. Glenn S. Burk, 406 LFD Drive, Littlefield, Texas.
Dr. Donald G. Cameron, Bank of America Building, Lompoc, California.
Dr. William B. Dorfman, 240 Main Street, Bristol, Connecticut.
Dr. Elmer H. Eger, Oellig Building, Suite 2, Coraopolis, Pennsylvania.
Dr. Donald T. Elliott, 2596 North High Street, Columbus, Ohio.
Dr. Salvi S. Grupposo, Bureau of Visual Science, American Optical Company, Southbridge, Massachuetts.
Dr. Arthur C. Heinsen, Jr., 1332 Lincoln Avenue, San Jose, California.
Dr. George C. Hodgens, 402 Odd Fellows Building, Raleigh, North Carolina.
Dr. I. W. Kinsey, 31 East College Street, Alliance, Ohio.
Dr. Max Levy, Jr., 4411 Montrose Boulevard, Houston, Texas.
Dr. Paul L. Magnuson, 116 East Main Street, Lancaster, Ohio.
Dr. J. Armand Messier, R. O., School of Optometry, University of Montreal, Montreal, P. Q., Canada.
Dr. M. L. Palmer, 1618 Main Street, Springfield, Massachusetts.
Dr. Chester H. Pheiffer, Southern College of Optometry, 865 Washington Avenue, Memphis, Tennessee.
Dr. J. F. Pocock, 59 West Main Street, Chillicothe, Ohio.
Dr. Hoyt S. Purvis, 212 Washington Avenue East, Jonesboro, Arkansas.
Dr. J. Stanley Rafalko, Southern College of Optometry, 865 Washington Avenue, Memphis, Tennessee.

Dr. Alfred A. Rosenbloom, Northern Illinois College of Optometry, 4170 Drexel Boulevard, Chicago, Illinois.

Dr. Max Schapero, Los Angeles College of Optometry, 950 West Jefferson Boulevard, Los Angeles, California.

Dr. G. Frederick Speiser, 116½ South Main, Mishawaka, Indiana.

Dr. I. Teitelbaum, 236 Franklin Street, Johnstown, Pennsylvania.

Dr. James F. Wahl, 343 South Main Street, Anna, Illinois.

Dr. Franklin A. Warren, Suite A., 59 North Main Street, Waterbury, Connecticut.

Dr. Lawrence A. West, Two Highland Avenue, Jersey City, New Jersey.

Dr. Joseph A. Wey, 177 Main Street, Painesville, Ohio.

Miss Isabella Mary Whitney, 108 Abington Street, Northampton, England.

Dr. Marshall Wright, Alimar Theatre Building, Live Oak, Florida.

Dr. Francis A. Young, Department of Psychology, State College of Washington, Pullman, Washington.

CONVENTION COMMENTS

For a few days, the Hotel New Yorker looked as though it had been taken over completely by optometry and allied sciences. Six eye care groups met at the hotel along with the Academy, and at almost any time of the day or evening, small groups of delegates could be found in the lobby, earnestly talking over mutual problems. Meetings were held by the National Interprofessional Committee on Eye Care, the officers and board of trustees of the American Optometric Association, the American Board of Opticianry, the Association of Military Optometrists, the National Board of Examiners in Optometry and members of the Association of Schools and Colleges in Optometry.

Graduate, Senior and special students at the School of Optometry, Columbia University, were guests at the Academy at the lecture sessions.

Lending a hand with registration this year was Mrs. Elaine Hansen, Mt. Kisco, New York. Registration was heavy enough this year to keep both your reporter and Mrs. Hansen busy not only all day Saturday, but most of Sunday as well. In prior years, registration usually could be buttoned up on the first day of the convention.

Those of us who do not live in critical areas, and whose civil defense programs are not as well organized, had a little trouble getting used to the "SHELTER" signs all over New York City. It brought a little closer to home the fact that we are in a national emergency, and that optometrists should push forward their part in being prepared.

Attendance was so high at the Sunday afternoon lecture sessions at Columbia University School of Optometry, that some papers were presented twice so all could hear them.

The New York Academy of Optometry, host to the Academy during its stay in New York, thoughtfully prepared an excellent list of restaurants as a guide to good eating for our Fellows. We can report from both personal experience and from general comment that this little brochure was a welcome and successful aid to strangers in Manhattan.

OBITUARY

WALTER BRACKETT LANCASTER

1863 - 1951

Dr. Walter B. Lancaster, prominent Boston ophthalmologist, died suddenly on December 9 at the age of 88. He had been active until the very end of his eventful career. His passing will be mourned by his many friends, both ophthalmologists and optometrists, upon whom he had a profound influence.

For more than half a century, Dr. Lancaster had been a leader in ophthalmology, devoting much of his time to the advancement of ophthalmic education. He was particularly interested in refraction, motility and physiologic optics as is evident from his numerous writings, lectures, and the instruments he devoloped. Among the latter are the Lancaster Red-Green Test for plotting diplopia fields, astigmatic and visual acuity charts. He is responsible for coining the word "aniseikonia" and for recognizing the clinical importance of this condition. He encouraged research and was always generous with his advice to all those who sought it, including the writer who acknowledges with deep gratitude Dr. Lancaster's inspiration and guidance on several papers.

Dr. Lancaster was born in Newton, Massachusetts and graduated from Harvard College in 1884 and from Harvard Medical School in 1889. Immediately, he went to Europe where he studied refraction, motility, and neuro-ophthalmology under Professor Mauthner in Vienna. From Vienna, Dr. Lancaster went to Paris and then to Edinburgh, where Maddox was also a student. Upon returning to Boston, he opened an office for ophthalmic practice and joined the staff of the Boston City Hospital. He was soon appointed to the staff of the Massachusetts Eye and Ear Infirmary; invited to give courses in refraction at the Boston Polyclinic; and, shortly thereafter he began teaching physiologic optics in the graduate department of Harvard Medical School.

Dr. Lancaster's interest and influence in improving methods of teaching and on requiring minimum standards for the practice of ophthalmology contributed greatly toward the formation in 1915 of the Committee on Examination in Ophthalmology which is now known as the American Board of Ophthalmology. He was one of the first members of that committee and prepared the plans for examination, wrote the syllabus and for many years guided the Board in evaluating and accrediting the training of ophthalmologists. Graduate training in ophthalmology had been largely a European monopoly. In the American clinics and hospitals the ophthalmological training consisted of

clinical practice with very little, if any, instruction in the fundamental sciences. Dr. Lancaster pointed out the need of instruction in basic courses (optics, bacteriology, pathology and biochemistry as applied in ophthalmology) and due largely to his leadership, there has been an expansion of graduate courses in ophthalmology in medical schools and hospitals throughout the country. One of these courses, given by the Ophthalmological Study Council, bears his name—The Lancaster Course in Ophthalmology. For the past several years, Dr. Lancaster had been preparing a textbook on Refraction which, after many revisions, he completed last summer and will be published soon by Chas. C. Thomas Co., Springfield, Illinois.

Besides the activities mentioned above, Dr. Lancaster was Chief of Staff, Dartmouth Eye Institute (1940-42); Clerk, Foundation for Vision, Inc.; Chairman, American Committee on Optics and Visual Physiology; member, American Orthoptic Council; member and past president, American Ophthalmological Society, American Academy of Ophthalmology and Otolaryngology, New England Ophthalmological Society, American Board of Ophthalmology, etc. For nearly twenty years, Dr. Lancaster has been active in the National Society for the Prevention of Blindness. He served as a major in the Medical Corps, U. S. Army Air Force, 1918-19, in charge of the ophthalmologic research laboratory in Mineola. Among the honors bestowed upon Dr. Lancaster were: D.Sc., Honoris Causa, Dartmouth College, 1939; Ophthalmic Research Medal, A.M.A., 1941; 5th DeScheinitz Lecture, Philadelphia, 1942; Leslie Dana Medal for Prevention of Blindness, 1943; International Ophthalmic Medal of American Ophthalmological Society, 1944; Lucien Howe medal by American Ophthalmological Society, 1945.

With respect to optometry, Dr. Lancaster maintained an open-minded, realistic attitude and was frequently helpful on committees designed to bring upon better interprofessional relationships. He insisted upon the criterion of, not what was best for the selfish interests of either optometrists or ophthalmologists, but what would be best for the public. In his chairman's address before the Section on Ophthalmology of the A.M.A. in 1928 (The Optometry Problem, J.A.M.A., 91, 1847-1848, December 15, 1928), Dr. Lancaster spoke these prophetic words: "If, as and when the optometrists organize a group of members who will set up professional standards and maintain them, consultation and cooperation will be welcomed by many eye physicians. This I firmly believe will come about." He concluded: "I believe that the optometrists will develop a professional spirit incompatible with commercialism. At

first only a small nucleus, it will permeate the whole body as a little leaven leavens the whole lump."

Just a few months ago, in October, 1951, Dr. Lancaster sat in at the meeting of the National Interprofessional Committee on Eye Care following which he told the writer that he was very happy to see the progress that had been made in improved harmony between optometry and ophthalmology which reflected his optimism of 1928 and which would inevitably result in better eye care for the public.

The American Academy of Optometry and our Journal take pride in paying homage to the accomplishments and exemplary life of Dr. Lancaster. For his guidance and influence in bringing about better ophthalmic education and improved optometric-ophthalmological relationships, we will be thankful always. May his spirit continue to motivate us as well as those who follow in his footsteps. REQUIESCAT IN PACE.

ROBERT E. BANNON

CURRENT COMMENTS

Virginia Huck
Editorial Assistant

Optometrists will confer a favor by sending news items of general interest for this department; such as relate to new instruments, clinical techniques, education, visual health and optometric legislation and organization.

NATIONAL INTERPROFESSIONAL COMMITTEE ON EYE CARE MEETS IN NEW YORK

A complete review of the background and objectives of the National Interprofessional Committee on Eye Care took place at a meeting held in New York City, December 9. In addition three new members were added to the committee. These are, for optometry, Dr. W. C. Ezell, Spartanburg, South Carolina; for ophthalmology, Dr. A. G. De Voe, New York, New York, and for opticianry, Mr. P. E. Demsey, Toledo, Ohio.

Although many problems of interprofessional relations were discussed, at this meeting the referral of patients consumed the major portion of the session. In this connection Dr. Glenn Moore presented to the committee for approval a statement of the official policy of the American Optometric Association relative to the interprofessional referral of patients and a second statement relative to opticianry. Both were approved by the committee in the following form:

A STATEMENT OF THE OFFICIAL POLICY OF THE AMERICAN OPTOMETRIC ASSOCIATION RELATIVE TO THE INTERPROFESSIONAL REFERRAL OF PATIENTS.

Referral of patients to ophthalmologists by optometrists and vice versa should be on a consultation basis with full reciprocal professional courtesies and privileges. Optometry appreciates that it may be necessary for the ophthalmologist to conduct a refraction or other investigation of the visual status in the diagnosis or treatment of ocular or other pathology. In case of the referral of a patient to an ophthalmologist by an optometrist, the former should give the latter a confidential report, which should include any information which may be coordinated in affording the best optometric care to the patient by the optometrist. The ophthalmologist should not furnish a prescription or advice relating to the optometric phase of the patient's condition to the patient.

A STATEMENT OF THE OFFICIAL POLICY OF THE AMERICAN OPTOMETRIC ASSOCIATION RELATIVE TO OPTICIANRY.

Since it has been the declared policy of optometry not to fill prescriptions originating with any other practitioner, optometry has no desire to interfere with opticianry in carrying out this activity. Optometry appreciates that many ophthalmologists have their prescriptions filled by opticians and optometry has no desire in any way to modify, impair or interfere with that relationship.

Committee members attending the meeting were Dr. Avery D. Prangen, Rochester, Minnesota, chairman; Dr. Glenn H. Moore, Chicago, Illinois; Dr. A. G. De Voe, New York, New York; Dr. Franklin M. Foote, director, National Society for the Prevention of Blindness; Mr. Leslie W. Myers, Minneapolis, Minnesota; Dr. Carel C. Koch, Minneapolis, Minnesota; Mr. Norman A. McLeod, Providence, Rhode Island; Mr. Henry O. Carpenter, Syracuse, New York; Dr. H. Ward Ewalt, Pittsburgh, Pennsylvania, and Mr. P. E. Demsey, Toledo, Ohio.

Several guests were also present at the meeting: Dr. Charles Sheard, Rochester, Minnesota; Mr. Leo W. Waldert, Rochester, New York; Dr. Harold Simmerman, Woodbury, New Jersey; Dr. J. Ottis White, Baton Rouge, Louisiana; Mr. M. J. Julian, New York City; Dr. Ernest Kiekenapp, Minneapolis, Minnesota; Dr. James F. Wahl, Anna, Illinois; Dr. William L. Benedict, Rochester, Minnesota; and Dr. Conrad Berens, New York, New York.

NEW ACADEMY ROSTER

There were many inquiries at the convention about plans of the Academy for publication of a new roster. The Academy does plan to publish a new roster in the near future, and a copy will be mailed to each Academy Fellow when completed.

CLEVELAND FORUM ON SCHOOL-CONNECTED VISUAL PROBLEMS

Nationally known speakers from optometry, ophthalmology and education will share the lecture rostrum at the coming Annual Forum of the A.O.A. Committee on Visual Problems in Schools, according to an

announcement by program chairman Dr. Lois B. Bing. Dates for the forum are February 15 through 17, 1952: the place, the Hollenden Hotel, Cleveland, Ohio. Papers on sight conservation, and the physical and pathological influences on eyesight in school will be given. Among the speakers will be Mr. Sylvester Guth, Nela Park, General Electric Company, and Dr. L. V. Johnson, professor in ophthalmology, Western Reserve University School of Medicine. Registrations to attend the Forum should be made through Dr. D. G. Hummel, 418 National City Bank Building, Cleveland 14, Ohio.

NEWS BRIEFS

Dr. Lawrence Fitch, Dean, Pennsylvania College of Optometry, was recently elected to his local Board of Education. . . . A.O.A. officials are at work on plans to make the June annual meeting in Miami Beach the "outstanding event of its kind in A.O.A. history." President Ottis White has named Dr. S. G. Schneider, Miami Beach general convention chairman. Dr. Schneider is editor of the *Journal of the Florida Optometric Association*. Congress Headquarters are in Suite 1, 528 Lincoln Road, Miami Beach. . . . Pennsylvania State College of Optometry's regular 10-day graduate course in the fitting of contact lenses is January 25-February 3. . . . Dr. Frederick C. Cordes, clinical professor of ophthalmology and chairman of the division of ophthalmology, University of California School of Medicine, San Francisco, was guest speaker at the Optometry Students' Association, University of California, meeting recently. . . . Coming meetings: California Optometric Association in Sacramento, February 21-24. Eastern States Optometric Congress, April 19-21, 1952. . . . Martha S. Stem, former staff writer for the *Pittsburgh Press* and a graduate journalist from the Pennsylvania College for Women, Pittsburgh, has joined the staff of the A.O.A. Department of Public Information. She will work with Dr. Elmer M. Soles, Director of the department. . . . Art-Craft Optical Company of Rochester, New York, has just released a new Luxury trim which consists of sets of gold-filled ornaments to be applied to Art Brow and Leading Lady dark zyl frames. Two, three or four pieces may be used to suit individual desire and in this way the patient can assist in designing the frame she is to wear. . . . At the recent AAAS annual meeting one of the papers presented covered the subject of highway accidents and visual ability. Dr. D. J. Moffie, Psychology Department, North Carolina State College presented the material compiled after many hundreds of accident prone drivers were checked with the ortho-rater. . . . Three Academy members were guests of honor at an Omega Epsilon Phi

Christmas party on the campus of Columbia University, December 14. The men honored were Drs. Bernard Mazow, Houston, Texas; Ernest Giglio, Bernardsville, New Jersey, and Daniel Woolf, New York City.

ABSTRACTS

MAINTENANCE OF EYE EFFICIENCY IN WORKERS.—Leo Price, M.D. (Director, Union Health Center, International Ladies' Garment Workers' Union, New York City) Publication No. 479, National Society for the Prevention of Blindness, Inc., 1790 Broadway, New York 19, 8 pp., 5 cents.

A survey among the members of the International Ladies' Garment Workers' Union in New York City revealed that many workers did not know their vision should be improved, or that their glasses failed to provide maximum comfort or efficiency. A total of 190,000 people are employed in the New York City area in the manufacture of ladies' garments. This report concerns the data resulting from a sample testing of 1,704 workers of varying ages. The testing was carried out in the shops during the working day with the aid of the Keystone Telebinocular.

The tests required each worker to be absent from his tasks only 10 minutes unless some language difficulties were encountered.

The following minimum standards were established for grading the workers' vision:

1. Operators of machines involving close work would be marked unsatisfactory if they registered a failure of near point visual acuity, or less than the equivalent of 20/50 in either eye for distance.
2. Pressers, drapers, cleaners, and hand-sewers would be marked unsatisfactory if they registered a failure of near point visual acuity, or less than the equivalent of 20/40 in either eye for distance.
3. Cutters would be marked unsatisfactory for failure of near point visual acuity or less than the equivalent of 20/30 in either eye for distance, or for a score of zero in depth perception.

The initial survey indicated:

(a) 32% of the workers tested had adequate vision in accordance with the temporary standards established.

(b) 51% needed some visual correction.

(c) 17% had adequate vision for their specific tasks, but needed correction for distance or for some other visual factor.

The author observed that: "There seems to be a tendency to purchase eyeglasses without submitting to the precaution of a thorough eye examination to detect and treat pathology and to correct visual defects. The lower cost of spectacles obtained directly from a dispensing shop probably accounts for the tendency."

In conclusion, the author states: "The most essential need is to educate the worker to secure the highest professional service for his visual needs, and to disregard low-price material inducements which often merely sell eye-glasses of questionable quality."

ROBERT E. BANNON.

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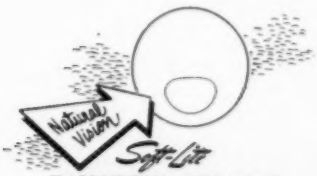

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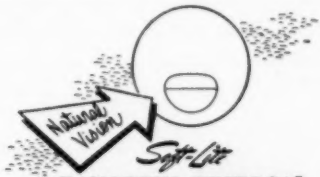

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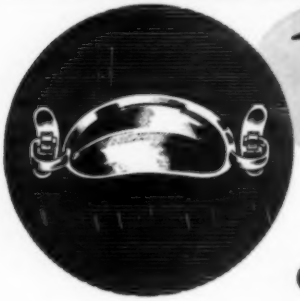

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- ☐ Monograph No. 60. Prismatic Prescriptions—A Clinical Report on 147 Cases. Irvin M. Borish. 16 p. + cover. Price 35c.
- ☐ Monograph No. 61. Comments on Psychosomatic Optometry with Reports on Subnormal Vision Cases. I. Irving Vics. 12 p. + cover. Price 30c.
- ☐ Monograph No. 62. A Study of Some Aspects of Peripheral Visual Acuity. Richard Feinberg. 24 p. + cover. Price 45c.
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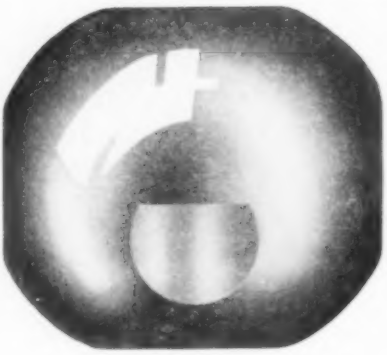

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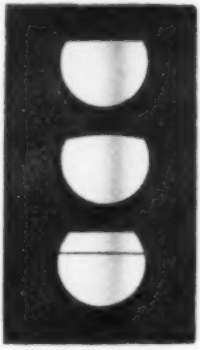

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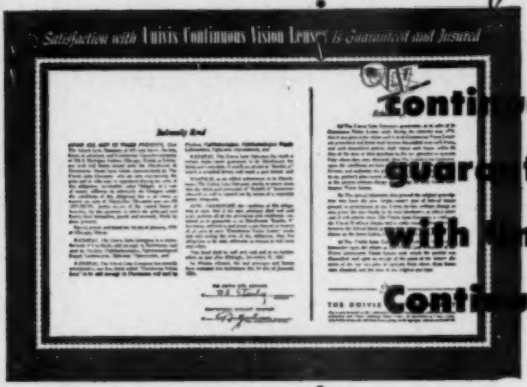

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